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A Member of The IT Group

Semiannual Site Status Monitoring Report
Williams Refining, L.L.C.
TDEC Facility ID No. 9-791214

Prepared for:

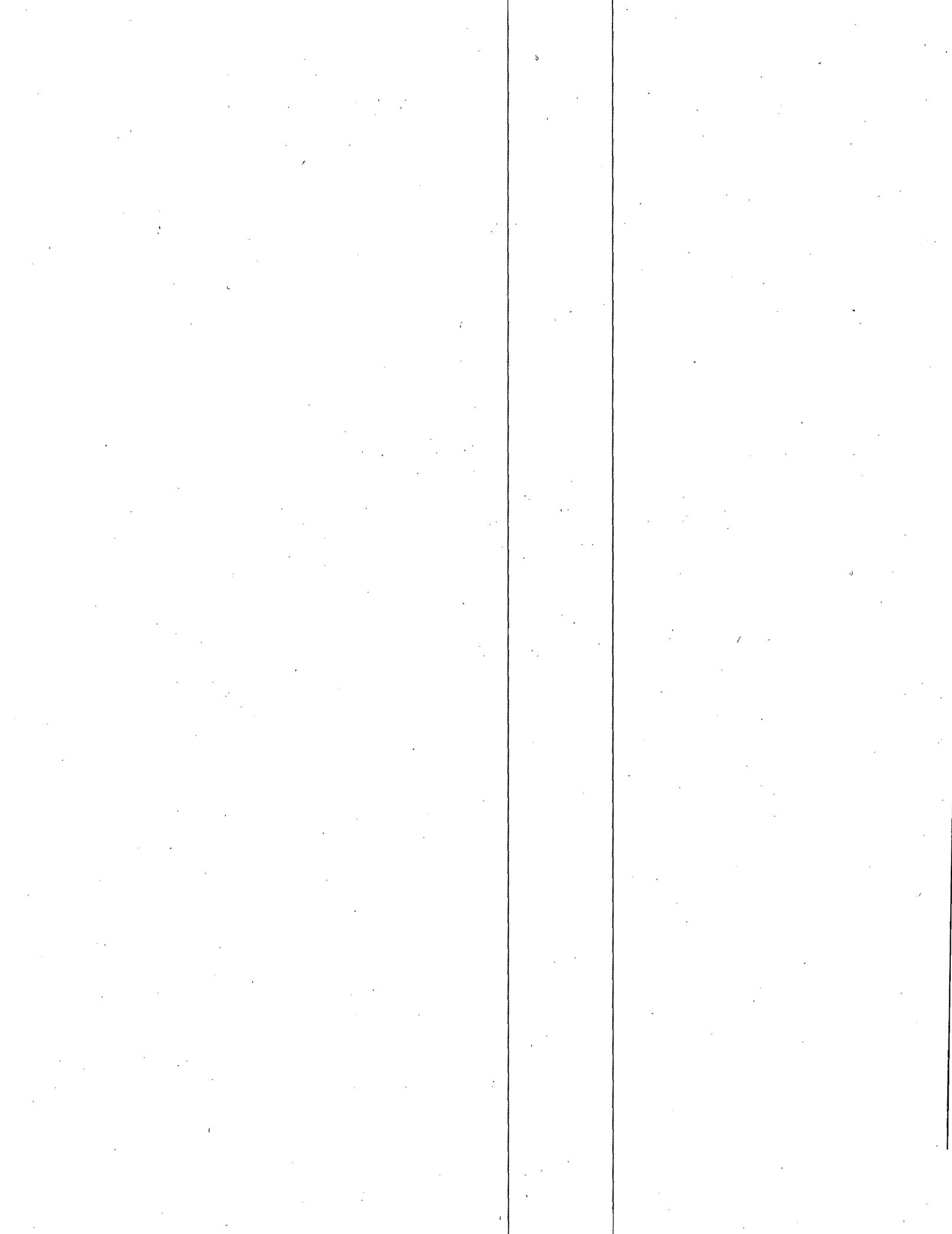
Williams Refining, L.L.C.
543 West Mallory Street
Memphis, Tennessee

Prepared by:

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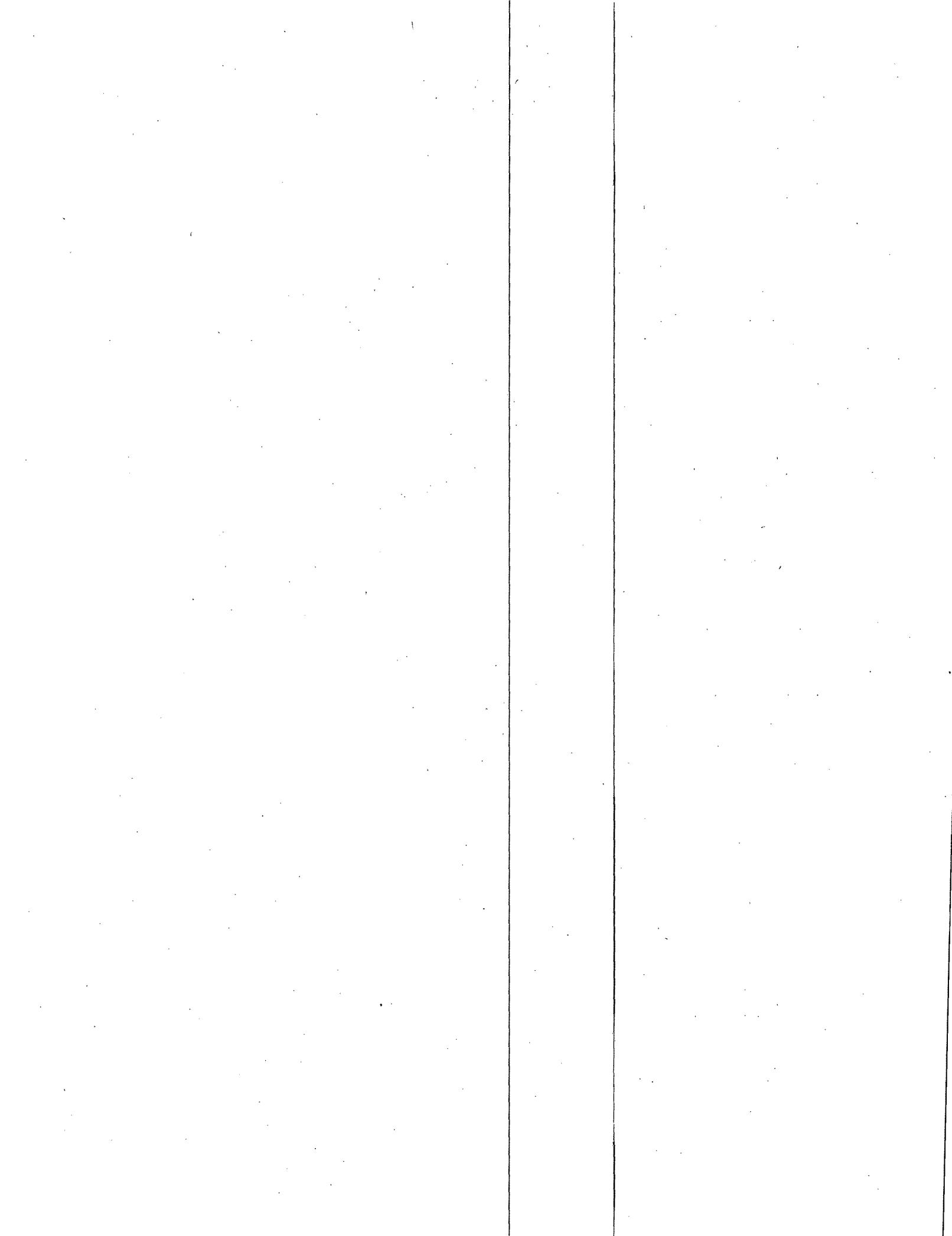
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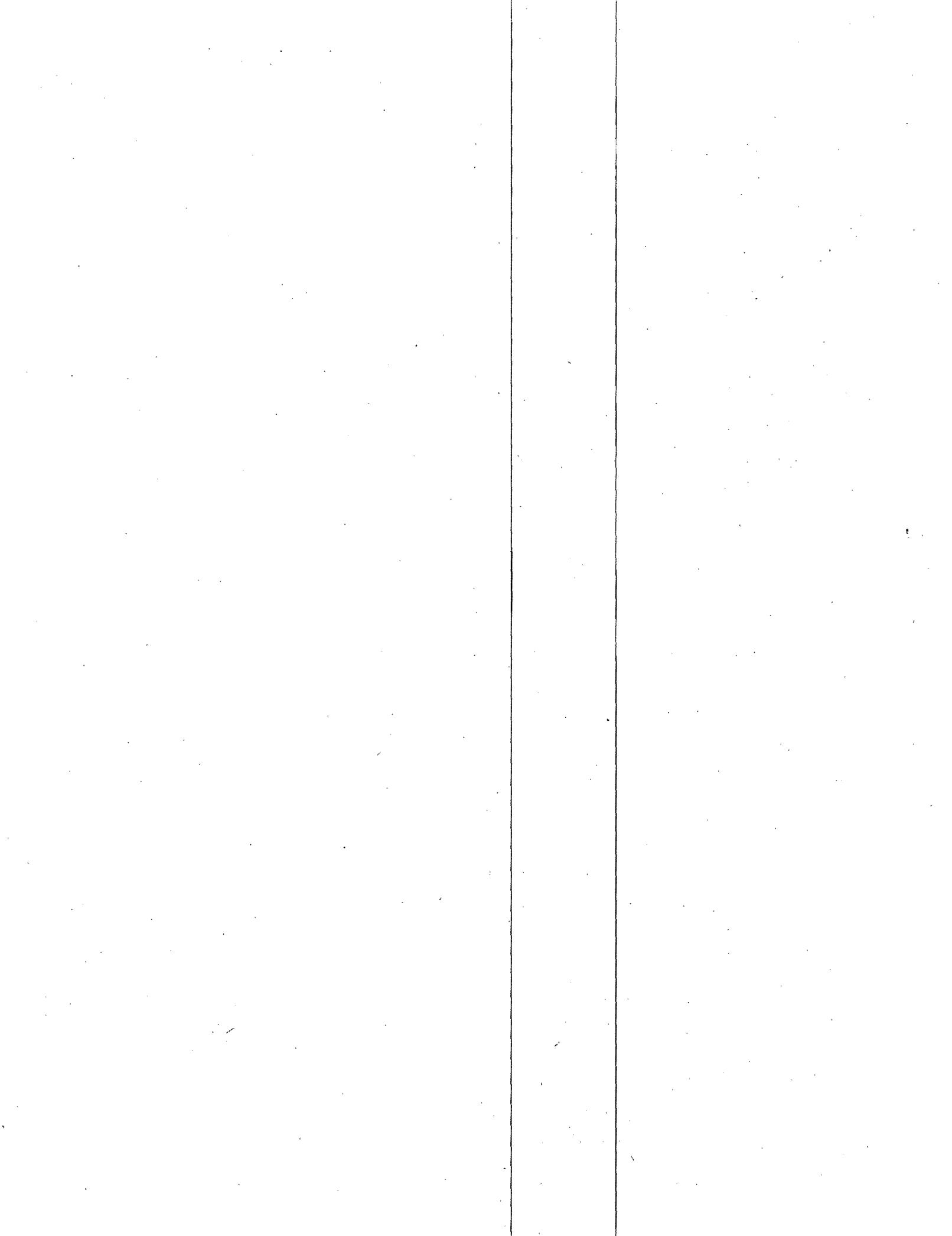


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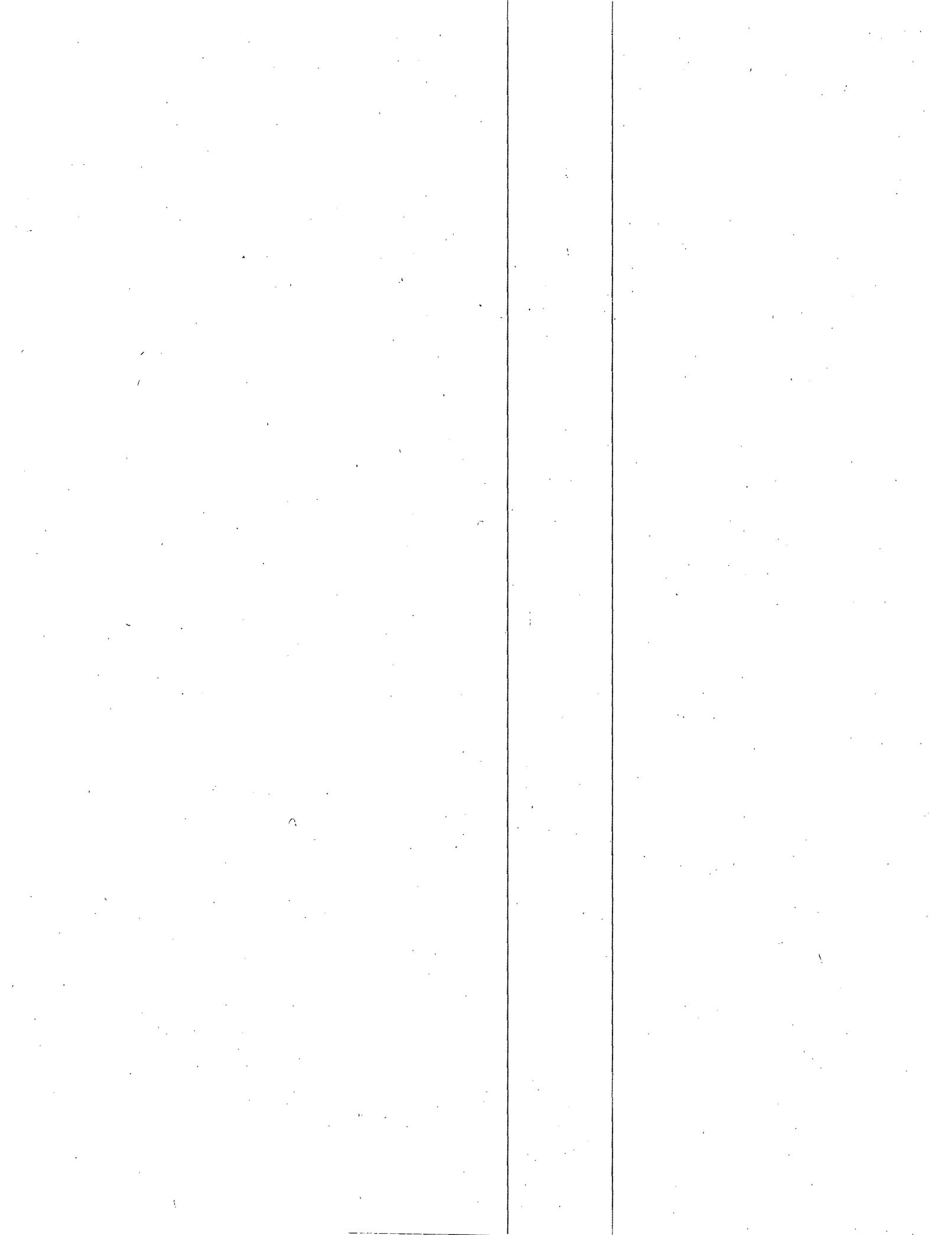
1.0 *Introduction*

This semi-annual site status monitoring report (SSMR), prepared by IT Corporation, is a summary of work performed at the Williams Refining, L.L.C. (Williams) refinery in Memphis, Tennessee during the six-month period of April 1, 1999 through September 30, 1999. The activities performed during this period included continued removal of light non-aqueous phase liquids (LNAPL) from the subsurface, and general maintenance of the groundwater recovery system. In addition, all wells were monitored and groundwater samples were collected and analyzed from monitoring wells MW-1, OW-6, OW-15, OW-29(R), OW-30, OW-31, OW-32, OW-34(R), OW-38, OW-40, OW-43 and OW-44.

The remediation project at the site was initiated in October 1984 in response to the presence of LNAPL in the underlying formation. The original system consisted of eight recovery wells (RW-1 through RW-8), which were installed between 1984 and 1987 and were designed to pump groundwater and LNAPL using dual submersible pump systems. After the amount of LNAPL was significantly reduced, the wells were converted to pump only groundwater. Three additional recovery wells (RW-9, RW-10, and RW-11) were installed in December 1992 on the west end of the site, and recovery well RW-12 was installed in July 1997. The primary purpose of RW-1 through RW-11 is to use hydraulic control to contain the LNAPL currently underlying the site. The groundwater recovered during this process is normally collected in an aboveground storage tank and recycled as feed water to the refinery's wet gas scrubber. The primary purpose of RW-12 is the recovery of free product. Until the installation of recovery well RW-12 could be completed, 13 french drains were installed in the vicinity of monitoring well OW-27 on the northeast portion of the property as an interim LNAPL recovery system. This action was in response to the detection of hydrocarbons in the storm sewer on the northeast side of the property. The remediation system currently employed at the site consists of 11 recovery wells (RW-1 through RW-6 and RW-8 through RW-12), five permanently located pneumatic LANPL recovery pumps, and a mobile LNAPL recovery unit.

To facilitate refinery construction activities, one monitoring well and two recovery wells were abandoned at the site. Monitoring well B-11 and recovery well RW-7 were closed between December 27 through 31, 1998. Recovery well RW-3 was closed, and a replacement well (RW-3(R)) was installed between March 15 and March 19, 1999.

To effectively recover LNAPL in observation wells across the site, the air-operated product recovery pumps are routinely rotated between the observation wells that frequently exhibit LNAPL. In addition, the mobile LNAPL recovery unit, which consists of a trailer-mounted holding tank and two air-driven pumps, has been used to remove LNAPL from observation wells that do not have dedicated LNAPL recovery pumps. The LANPL is recovered from the french drains using a vacuum truck. All LANPL recovered as a result of the remediation efforts is recycled through the refining process.



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2.0 Progress

The following significant activities were completed between April 1, 1999 and September 30, 1999.

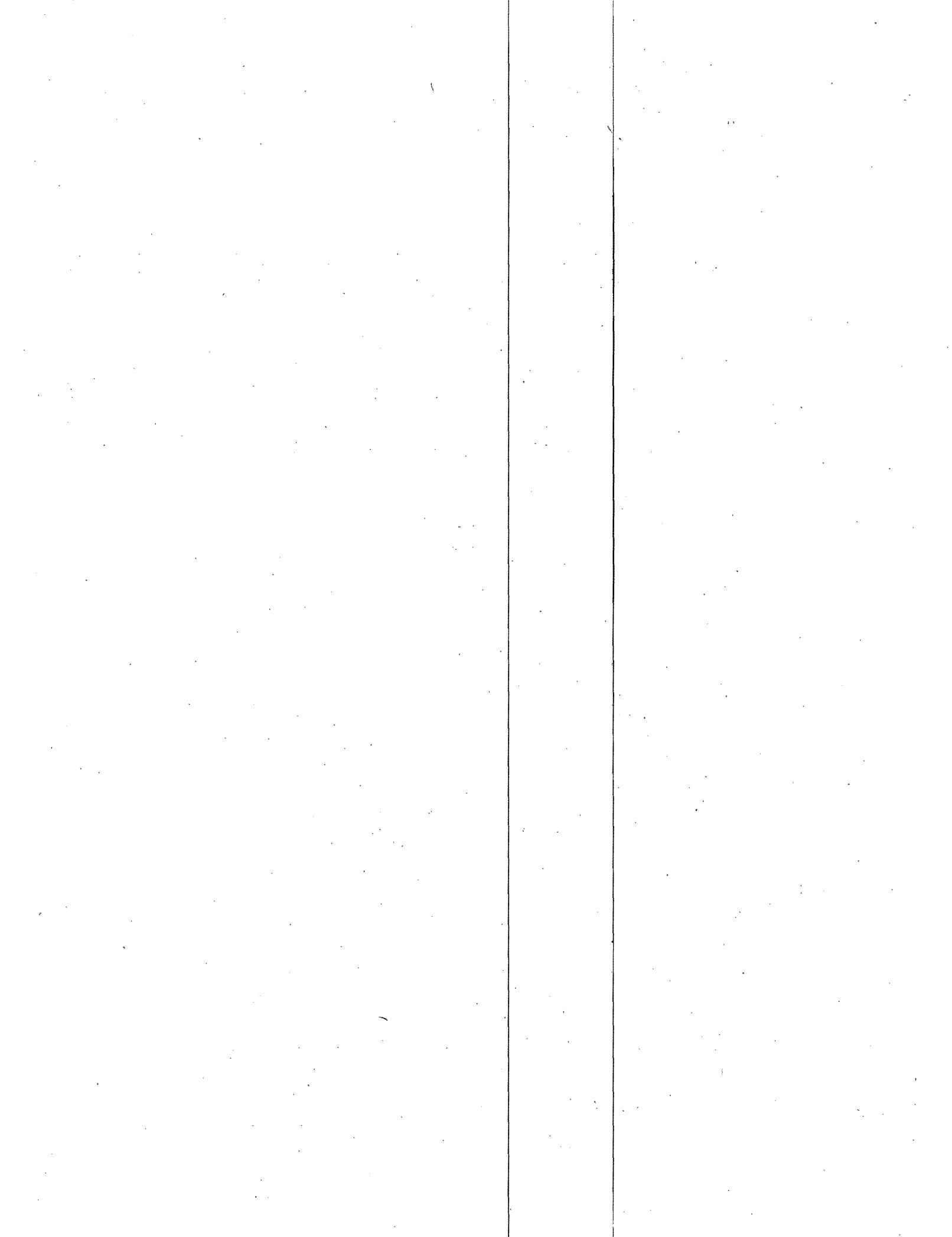
- Groundwater remediation continued throughout the period.
- Quarterly liquid level measurements were obtained from all site monitoring wells and recovery wells on June 30, 1999 and September 27, 1999.
- Monitoring wells OW-29 and OW-34 were closed and replacement wells (OW-29(R) and OW-34(R)) were installed on September 23, 1999.
- Semi-annual groundwater sampling activities were conducted on September 28, 1999 and October 14, 1999.
- On October 4, 1999, samples of LNAPL were collected from several monitoring wells at the site. The samples were used to determine the specific gravity of the LNAPL at various locations throughout the apparent LNAPL plume(s).

2.1 Remediation Progress

The remediation system at the site currently consists of eleven recovery wells (RW-1 through RW-6 and RW-8 through RW-12). With the exception of recovery well RW-12, all recovery wells are equipped with electric submersible pumps to depress the water table. Recovery well RW-12 is equipped with a pneumatic pumping system for total fluids extraction. Five permanently located pneumatic pumps and a mobile product recovery trailer are used to recover LNAPL. The mobile unit, which consists of a trailer-mounted pneumatic pump and holding tank, is used to pump LNAPL from wells that consistently exhibit measurable LNAPL thicknesses.

Table 1 presents a summary of the volume of groundwater, the mass of dissolved total petroleum hydrocarbons (TPH) and the mass of dissolved benzene recovered by the remediation system during the six-month period of April 1, 1999 through September 30, 1999, in addition to the previous three six-month periods. Based on the flow meter readings and the effluent analytical data collected during this period:

- 9,606,000 gallons of groundwater was pumped from recovery wells RW-1 through RW-11, for a combined average flow rate of 36.5 gallons per minute (gpm);
- 565,022 gallons of groundwater was pumped from recovery well RW-12, for an average flow rate of 2.1 gpm.
- Approximately 856 pounds of dissolved benzene was removed by the groundwater pump and treat system (RW-1 through RW-12); and
- Approximately 1,787 pounds of dissolved TPH was removed by the groundwater pump and treat system (RW-1 through RW-12).



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Since January 1995, the estimated cumulative mass of dissolved benzene removed by the groundwater pump and treat system is 10,845 pounds. The estimated cumulative mass of dissolved TPH removed by the system is 33,219 pounds.

The Certificates of Analysis used as the basis to calculate the mass of dissolved benzene and TPH (GRO and EPH) removed are presented in **Appendix A**. The mass removal calculations for these constituents are presented in **Appendix B**.

A summary of the volume of LNAPL removed from individual well locations is presented in **Table 2**. During the past six-month period, a total of 1,658 gallons of LNAPL was removed from on-site wells.

2.2 Well Abandonment and Installation.

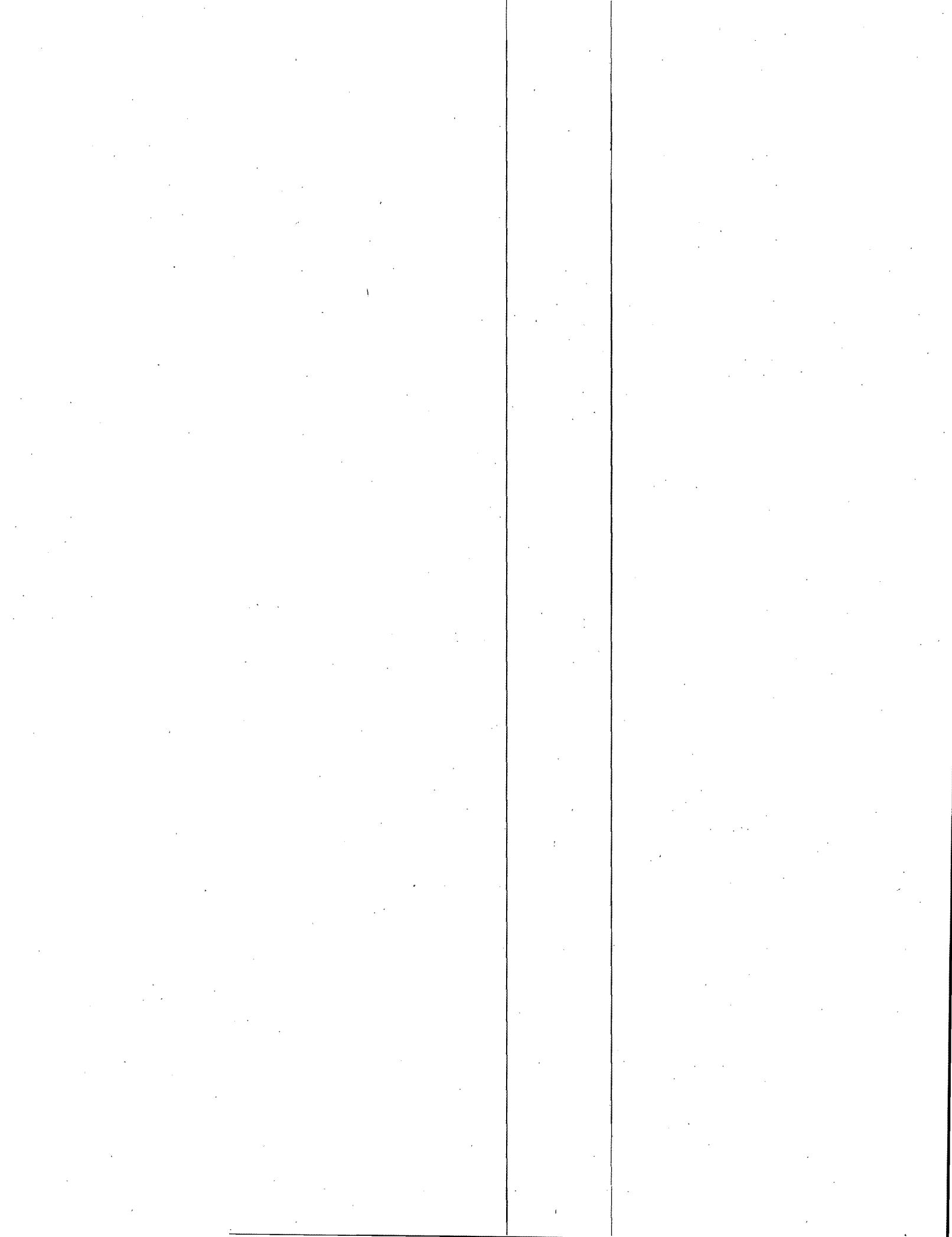
In response to problems encountered during well development activities, which were performed during the previous monitoring period (October 1998 through March 1999), two monitoring wells (OW-29 and OW-34) were abandoned and re-installed. The following describes the conditions that lead to the decision to abandon and re-install these wells.

OW-29 After developing monitoring well OW-29 (March 1999), the well became pressurized and turbulent groundwater conditions were observed in the well. This phenomenon, which continued throughout the current reporting period, prevented collection of a groundwater sample during the previous monitoring period (October 1998 through March 1999).

OW-34 By comparing the well construction log with field measurements of the depth to bottom of monitoring well OW-34, it was determined that approximately 50 percent of the well had become in-filled with material. Attempts to develop the well to remove the material (March 1999) were unsuccessful. In addition, liquid level measurements collected from this well indicate that the top of the water table is historically above the top of the well screen, and therefore is unsuitable for continuous detection of LNAPL.

To facilitate abandonment of monitoring wells OW-29 and OW-34, both wells were closed on September 23, 1999 by tremie-pumping grout material (portland and bentonite) from the bottoms of the wells to approximately two feet below surface grade. The casings above the grout material were then cut off and surface areas were re-graded.

After monitoring wells OW-29 and OW-34 were abandoned, replacement wells OW-29(R) and OW-34(R) were installed within ten feet of the abandoned wells. Replacement well OW-29(R)



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was augered to a depth of approximately 35 feet below surface grade (BSG) and OW-34 was augered to a depth of approximately 60 feet BSG. Both wells were constructed of 2-inch inside-diameter, flush-joint, schedule 40 PVC casing and screen. In OW-29, the screen interval extends from approximately 60 feet to 10 feet BSG. In OW-34, the screen interval extends from approximately 35 feet to 10 feet BSG. In both wells, the annular space between the bore hole and well screen was filled with sand filter pack to a depth of approximately 2 feet above the top of screen. Two-foot-thick bentonite seals were placed above the filter packs, and the remainder of the bore holes were filled by tremie-pumping grout material (portland and bentonite) to ground surface. The top-of-casing of each well extend to approximately 3 feet above surface grade. Steel protectors, set in 2-foot by 2-foot by 8-inch-thick concrete pads, were installed to protect the top-of-casing of each well. The top-of-casing elevations of OW-29(R) and OW-34(R) were then re-surveyed relative to surrounding wells.

2.3 Quarterly Liquid Level Measurement

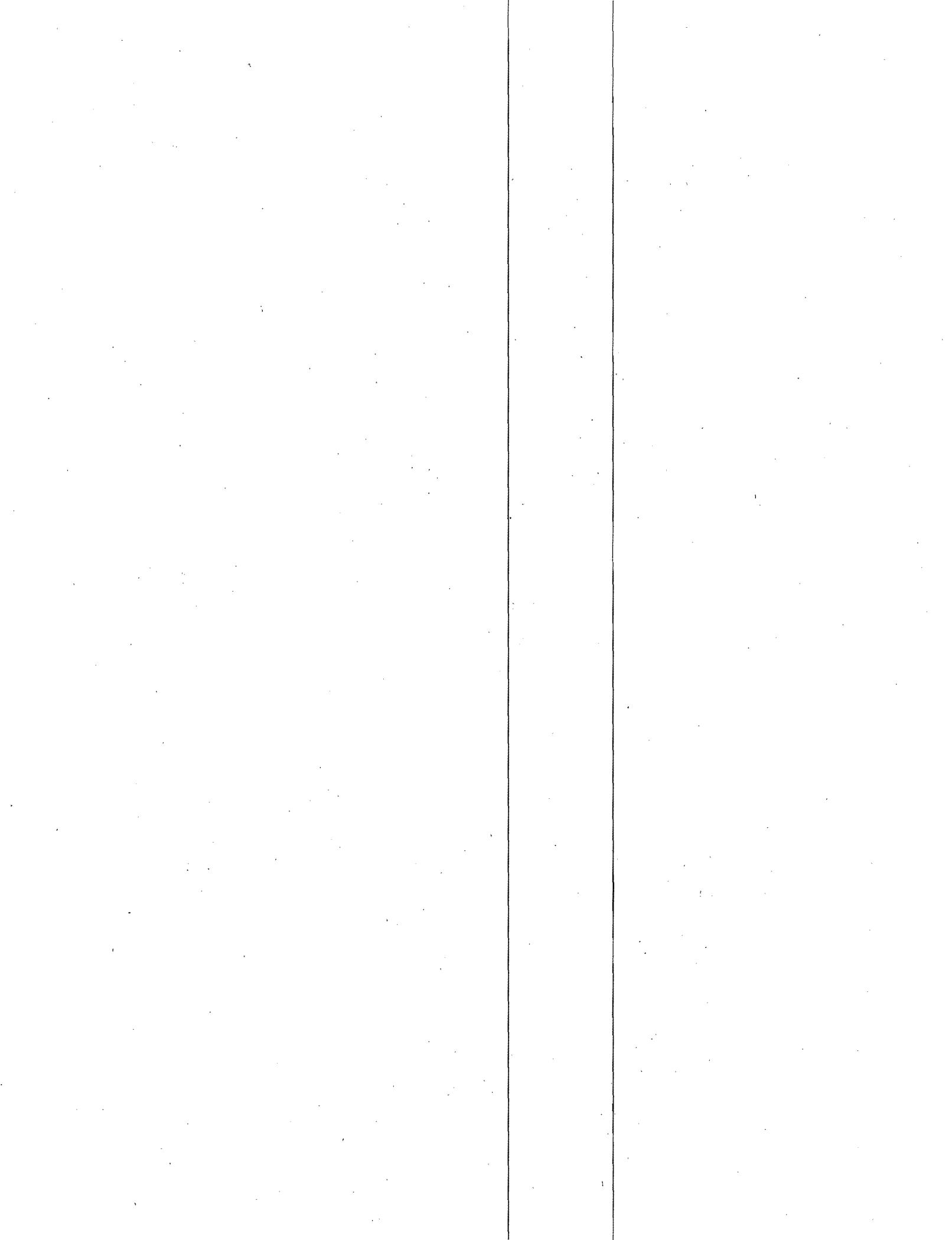
Liquid levels (i.e., depth to water and depth to LNAPL) in all accessible monitoring wells and recovery wells are currently measured on a quarterly basis. During this reporting period, liquid measurements were performed on June 30, 1999 and September 27, 1999. These data are presented on **Table 3** and **Table 4**.

2.4 Semi-Annual Groundwater Sampling Activities

Semi-annual groundwater sampling activities were performed on September 28, 1999. These activities consisted of the purging of a minimum of three well volumes of groundwater, and the collection of groundwater samples from monitoring wells located around the perimeter of the site. During this sampling event, groundwater samples were collected from twelve on-site monitoring wells (MW-1, OW-6, OW-15, OW-29(R), OW-30, OW-31, OW-32, OW-34(R), OW-38, OW-40, OW-43 and OW-44). The samples were submitted under chain-of-custody to Specialized Assays, Inc. (Nashville, Tennessee) for analysis by:

- EPA Method 8021B, to determine dissolved concentrations of benzene, toluene, ethylbenzene and total xylenes (BTEX);
- Tennessee Methods, to determine concentrations of gasoline range organics (GRO); and
- Tennessee Methods, to determine concentrations of extractable petroleum hydrocarbons (EPH).

Due to problems at the laboratory, the sample aliquots collected for EPH analyses were inadvertently compromised. Samples for EPH analysis were, therefore, re-collected at the site on October 13, 1999.



The Laboratory Certificates for the September 28, and October 13, 1999 groundwater sampling events are presented in **Appendix C**. A summary of these analytical data is presented on **Table 4**.

2.5 LNAPL Specific Gravity Determination

To account for the effect of LNAPL accumulations on the water table in wells containing LNAPL, depth to water data are adjusted using the following equation:

$$DTW_C = DTW_M + (Thickness_{LNAPL} + SG_{LNAPL})$$

Where:

DTW_C is the corrected depth to water;

DTW_M is the measured depth to water;

$Thickness_{LNAPL}$ is the thickness of LNAPL measured in the well; and

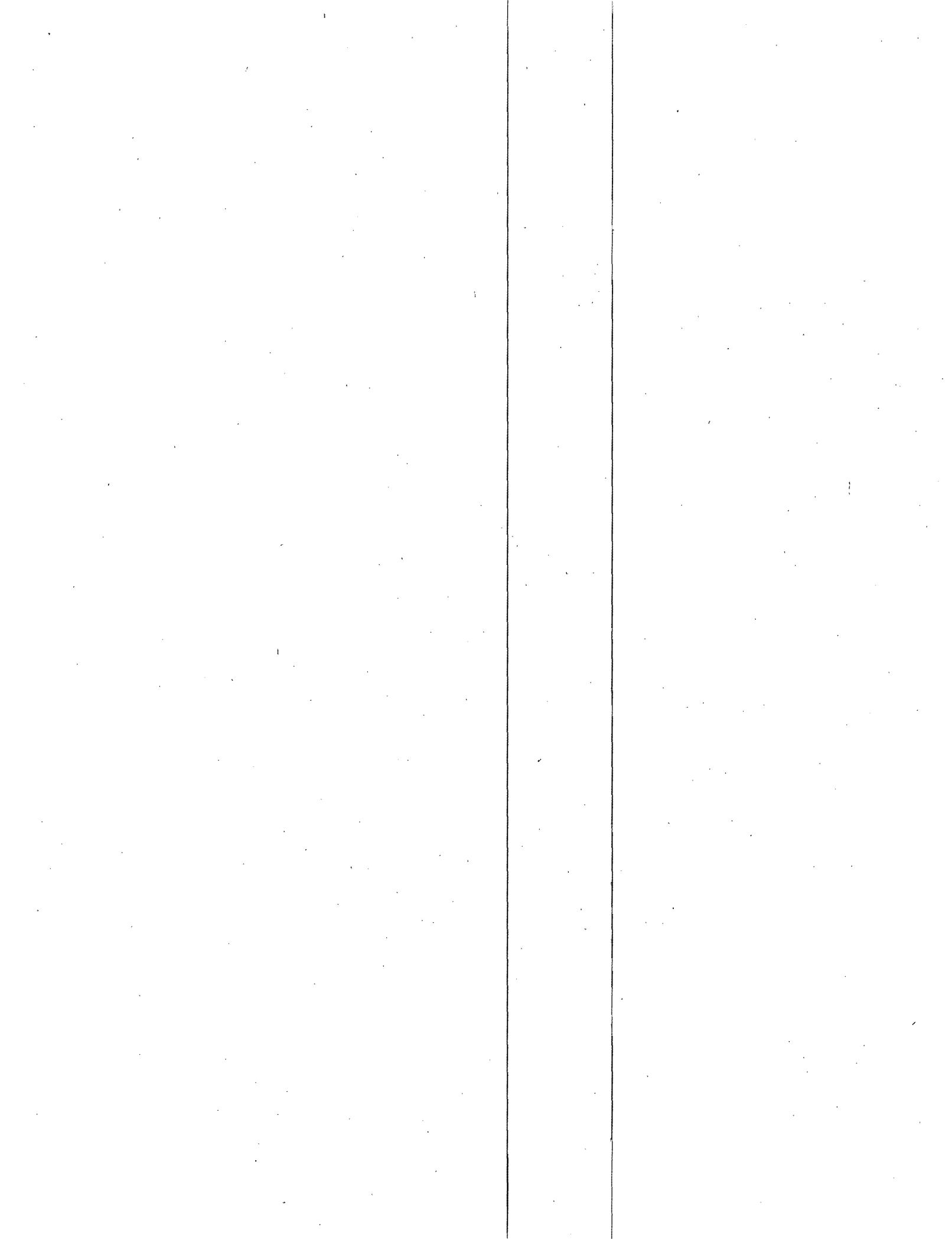
SG_{LNAPL} is the specific gravity of the LNAPL.

In the past, the depths to water data were corrected using a generic specific gravity of 0.80. This value is within the range of specific gravities for various petroleum hydrocarbon products, and is generally applicable for relatively thin accumulations of LNAPL. At the Williams refinery, however, the LNAPL plume(s) may be comprised of various petroleum products, and measured accumulations have been relatively thick in some areas.

To more accurately account for the effect of LNAPL accumulations on the water table in wells containing LNAPL, and to more accurately determine water table elevations, samples of LNAPL were collected from several wells at the site. The samples were used to determine the specific gravity of the LNAPL at various locations throughout the apparent LNAPL plume(s).

In determining groundwater elevations for the preparation groundwater elevation contours, the measured LNAPL specific gravities were used to correct the measured depths to water. For wells in which the LNAPL specific gravity was not measured, the LNAPL specific gravity measured in a nearby well was used to correct the depths to water. For wells located in areas of the site that the LNAPL specific gravity was not measured, a generic LNAPL specific gravity of 0.8000 was used.

The following table shows the wells that the LNAPL specific gravities were measured (i.e., reference well), the LNAPL specific gravity, and the wells that the LNAPL specific gravities were assumed (i.e., corresponding wells).



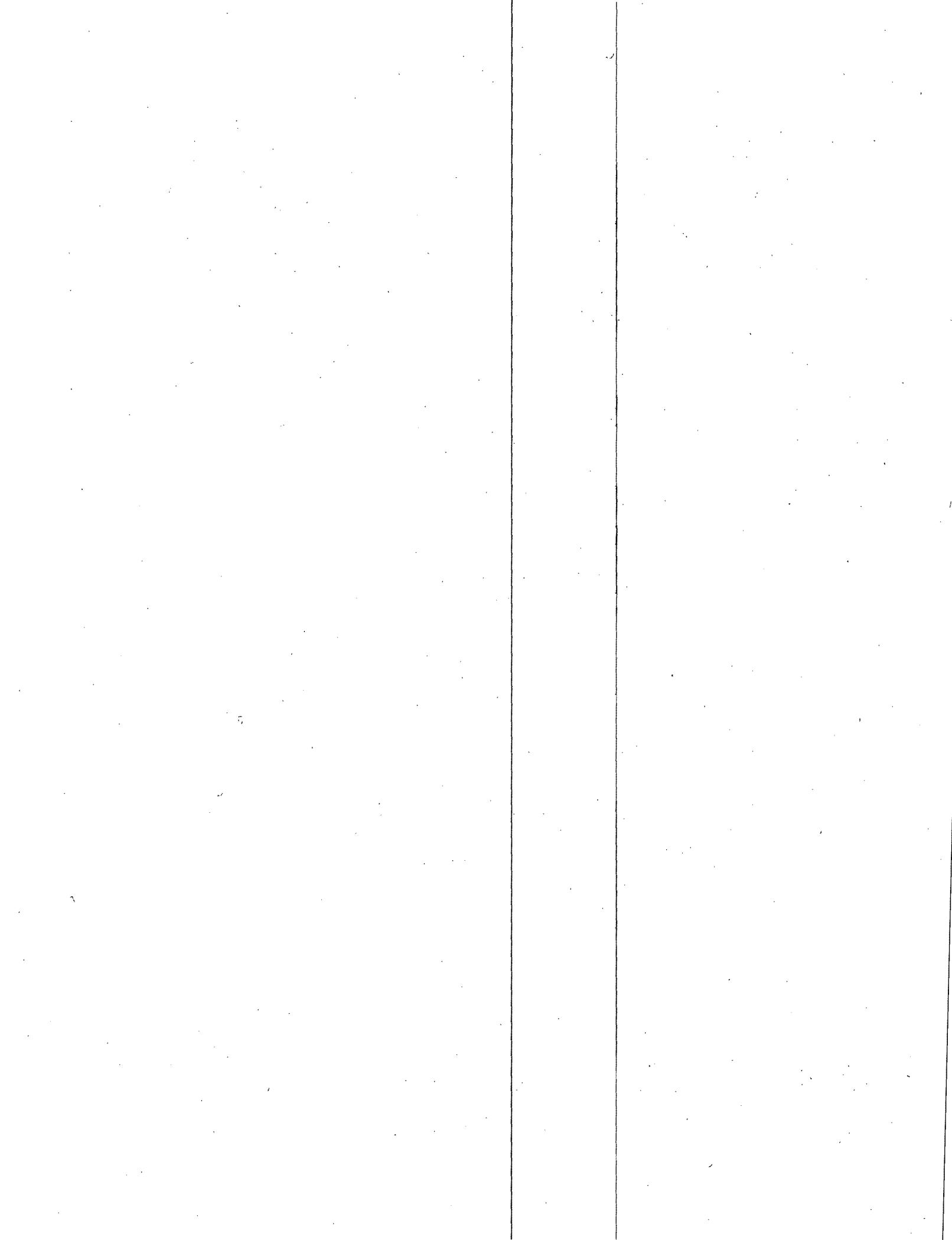
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Reference Well	Specific Gravity	Corresponding Wells
B-1	0.7788	RW-4, RW-5, RW-6, B-2, B-5, B-7, B-8,
G-3	0.7905	
G-5	0.8328	
OW-16	0.8468	RW-1, OW-12
OW-27	0.7420	RW-12, OW-26, G-2
OW-36	0.7999	
OW-39	0.8713	
RW-3[R]	0.8008	RW-3, B-9
RW-8	0.8265	G-1, OW-14,
None	0.8000	RW-10, OW-17, OW-22, OW-23, OW-24,



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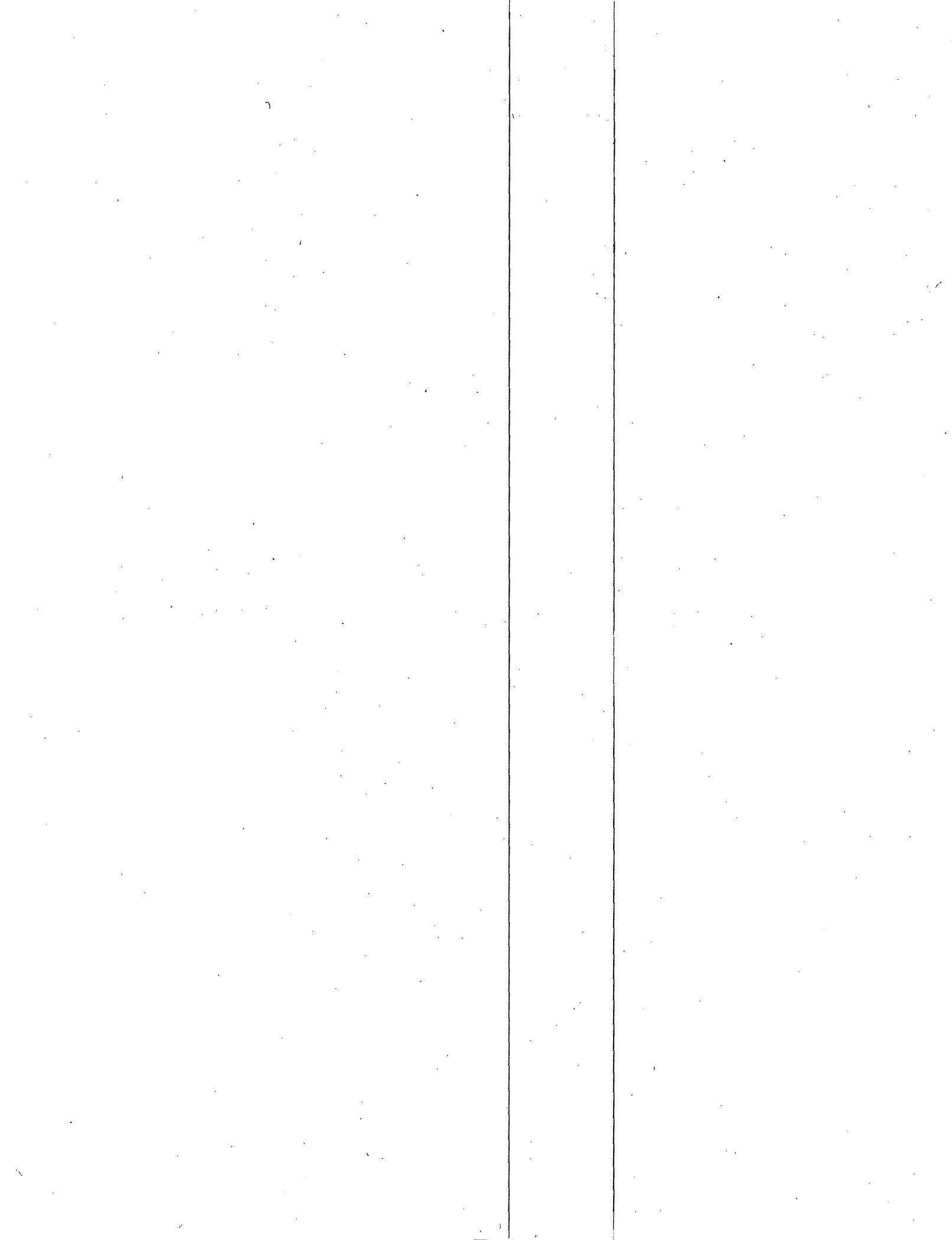
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3.0 Problems

Subsequent to purging monitoring well OW-26, to facilitate the collection of a groundwater sample, on September 27, 1999, a measurable thickness of LNAPL (0.35 feet) was detected in the well. As a result of detecting of LNAPL, a groundwater sample was not collected from monitoring well OW-26. This was the first time LNAPL was detected in monitoring well OW-26. Due to the critical location of this well, the decision was made to monitor OW-26 on a weekly basis and to purge the well of accumulated LNAPL. Weekly monitoring and purging will continue until it is determined that this frequency is no longer deemed necessary.

Overall, the remediation system experienced minimal downtime during the period; 6.6% for recovery wells RW-1 through RW-11 and 3.3% for RW-12. This downtime was the result of the need to shutdown the remediation system to facilitate scheduled refinery construction and maintenance activities. Individual recovery wells, however, experienced more significant sporadic downtime during the period. The reason(s) for the sporadic downtime associated with individual recovery wells have not yet fully been diagnosed, but appear(s) to be related to electrical and or mechanical problems associated with the pumps and associated pump control equipment and wiring. To better understand, and therefore mitigate the problems associated with the observed downtime, IT Corporation completed a survey of the equipment and electrical system at each recovery well. The results of the survey are currently being compiled and reviewed.

*Report on
the should be submitted to State*



4.0 Water Monitoring

4.1 Potentiometric Data

Groundwater elevation and apparent LNAPL thickness data collected June 30, 1999 and September 27, 1999 are summarized on **Table 3** and **Table 4**. **Figure 2** and **Figure 3**, respectively, depict apparent LNAPL thickness contours for these two dates. Volumes of LNAPL in the subsurface were calculated based on the apparent LNAPL thickness contours shown on **Figure 2** and **Figure 3**. Based on these calculations (presented in **Appendix B**), the estimated volume of LNAPL underlying the site was 2,577,339 gallons on June 30, 1999 and 1,784,984 gallons on September 27, 1999. For comparison, the following provides a summary of previous volume estimates.

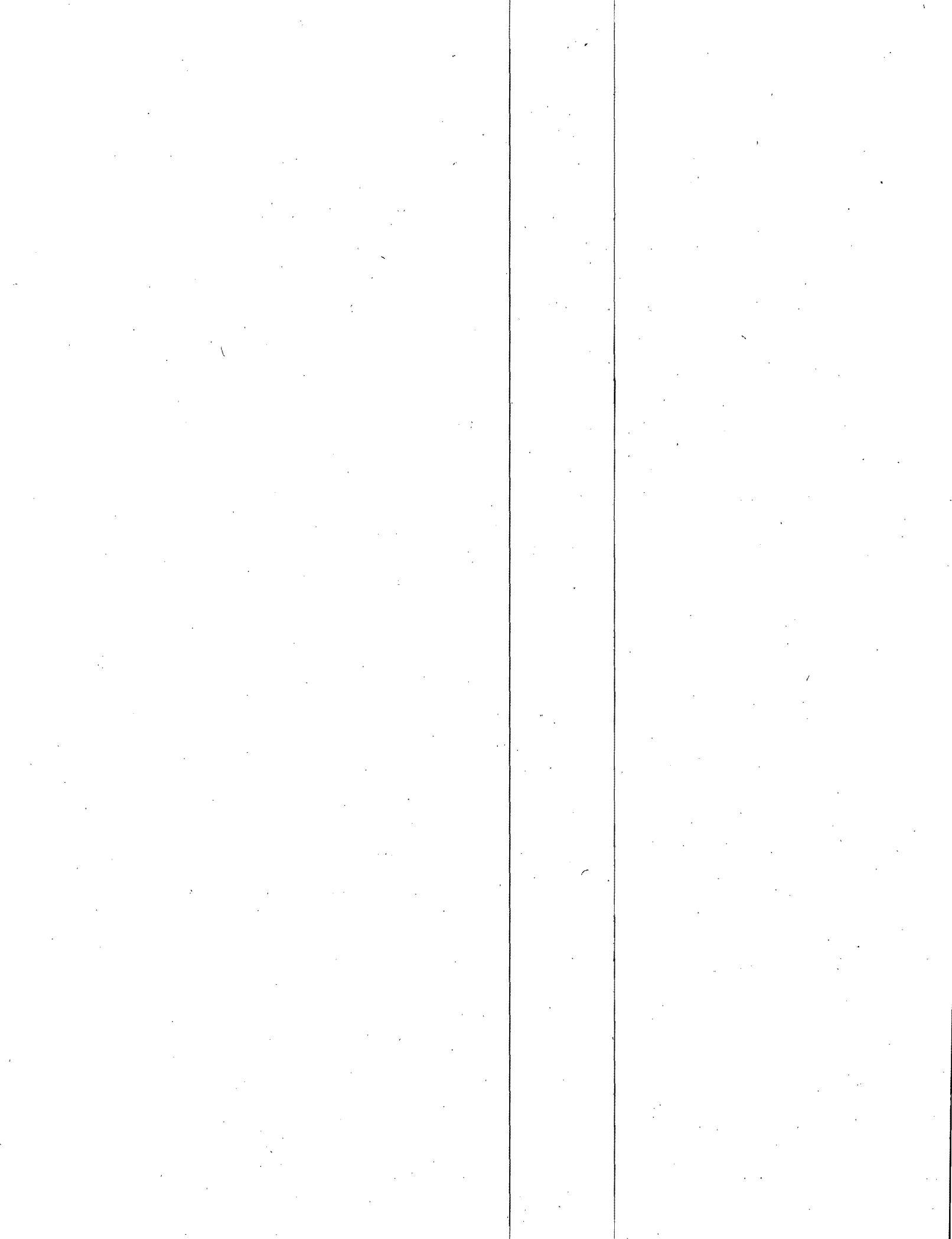
<u>DATE</u>	<u>VOLUME</u>	<u>DATE</u>	<u>VOLUME</u>
08/90	2,156,821	09/97	4,737,645
06/93	1,559,034	02/98	3,555,735
06/94	1,652,834	09/98	1,298,617
07/95	1,717,171	03/99	2,242,439
04/96	1,455,443	06/99	2,577,339
04/97	1,080,262	09/99	1,784,984

These estimates were based on apparent LNAPL thicknesses measured in monitoring and recovery wells. Because apparent LNAPL thicknesses measured in monitoring and recovery wells tend to over estimate the true LNAPL thicknesses in formation, over estimation of the volume of LNAPL in formation is an inherent consequence. In addition, calculation of the volume of the LNAPL plume has a high level of variance due to:

- Estimations in drawing the contours;
- Fluctuations of groundwater levels from event to event; and
- The effectiveness of ongoing remediation at the site.

Appendix D contains a summary of liquid level data collected from several key monitoring wells and recovery wells between October 1997 and September 1999. Included are graphs of water table elevations and LNAPL thicknesses over time. Based on review of these graphs, for the past six months, the water table elevation steadily decreased across the site. During this six-month period, the apparent thickness of free product has, generally:

- Increased in G-3, OW-12, OW-16, OW-17, OW-23, OW-24, OW-36, and RW-3(R);
- Decreased in B-2, B-5, B-8, G-1, OW-22, OW-27, OW-39, RW-1, RW-4; RW-6, RW-10 and RW-12; and
- Remained stable in B-7, B-9, G-5, and OW-14.



Throughout the monitoring period, the apparent thickness of LNAPL in monitoring well B-9, with the exception of the thickness measured on September 7, 1999 (3.83 feet), the apparent LNAPL thickness remained stable. In monitoring well B-1, the apparent LNAPL thickness initially decreased in at the beginning of April 1999 and then steadily increased during the period. LNAPL was essentially not detected in recovery well RW-5. Between April 1999 and October 1999, the general trend of apparent LNAPL thickness in recovery well RW-8 is inconclusive. Historically, LNAPL had not been detected in monitoring well OW-26. On September 28, 1999, however, LNAPL was detected (approximately 0.35 feet) after purging the well to facilitate collection of a groundwater sample.

Figure 4 and **Figure 5**, respectively, illustrate the groundwater elevation contours in June 1999 and September 1999. With the exception of the northeast portion of the site, groundwater flow across much of the site is generally toward the southwest. In the northeast portion of the site, localized groundwater flow appears to be generally toward the northeast.

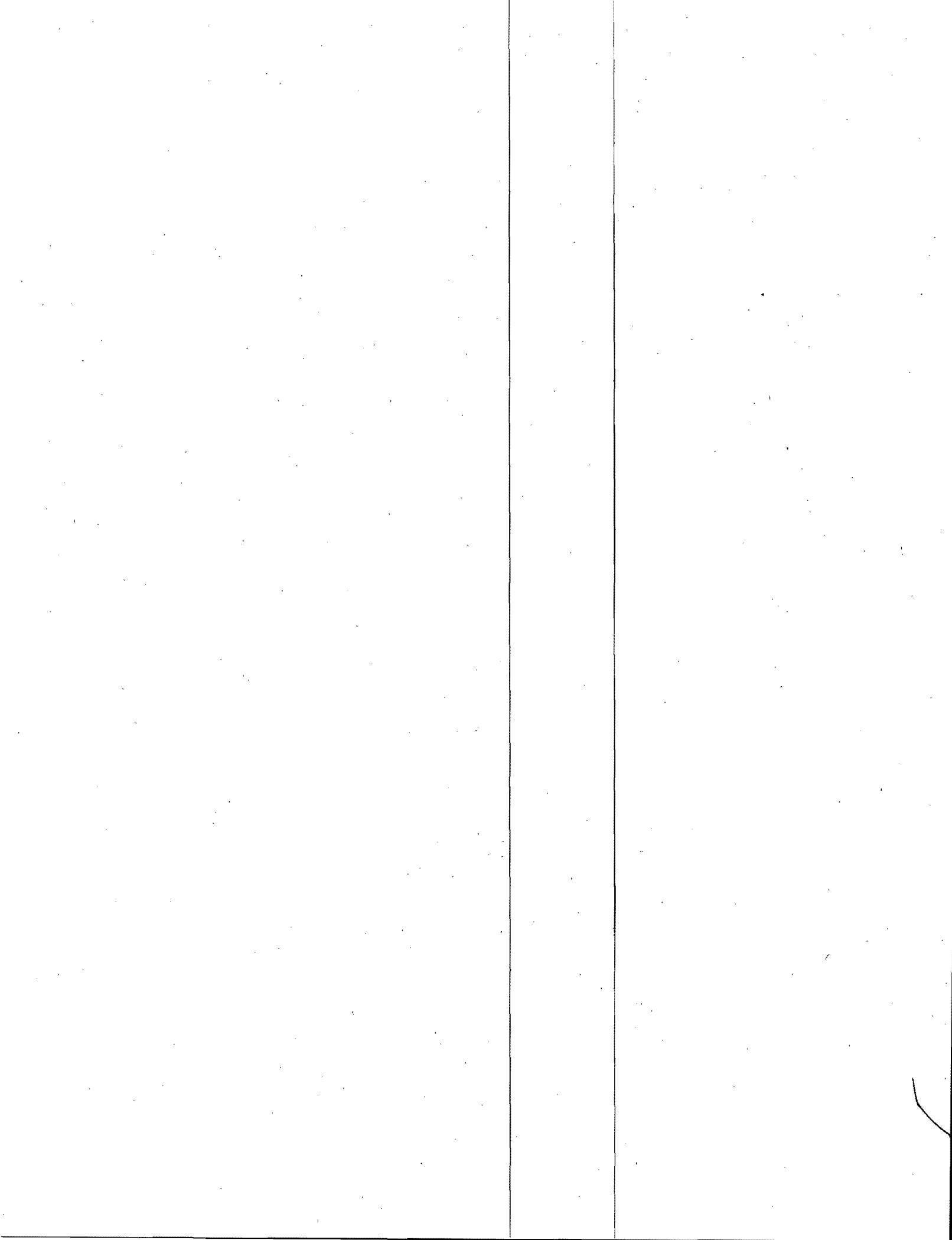
Appendix E contains a summary of the liquid level data collected from the perimeter monitoring wells during the most recent and previous semi-annual site status monitoring events. Included are graphs depicting water table elevations over time. The September 1999 monitoring event indicates an overall decrease (in the range of 10 to 15 feet) in groundwater elevations from the previous monitoring event.

4.2 Analytical Data

To determine the horizontal extent of dissolved-phase constituents on the boundaries of the site, groundwater samples were collected from 12 on-site perimeter monitoring wells (MW-1, OW-6, OW-15, OW-29(R), OW-30, OW-31, OW-32, OW-34(R), OW-38, OW-40, OW-43 and OW-44) on September 28, 1999. As previously noted, monitoring well OW-26 was not sampled due to the presence of a measurable thickness (0.35 feet) LNAPL detected in the well. The samples were submitted for laboratory analyses to determine the concentrations of BTEX, GRO, as well as EPH.

Groundwater analytical results for the most recent sampling event are summarized on **Table 4**. During the current monitoring period, benzene was detected in monitoring wells OW-15 (0.0038 ppm), OW-29(R) (0.001 ppm), OW-31 (1.964 ppm), OW-38 (0.0128 ppm), OW-43 (0.0081 ppm), OW-44 (0.0068 ppm), and MW-1 (0.0047 ppm). Of these, only monitoring well OW-31 exhibited a concentration that exceeds the non drinking water action limit of 0.070 ppm.

TPH (TPH-GRO and EPH, combined) was detected in monitoring wells OW-6 (2.99 ppm), OW-15 (0.19 ppm), OW-29(R) (0.46 ppm), OW-30 (0.31 ppm), OW-31 (6.52 ppm), OW-32 (0.34 ppm), OW-38 (5.59 ppm), OW-43 (0.37 ppm), OW-44 (0.85 ppm), and MW-1 (0.34 ppm). Of



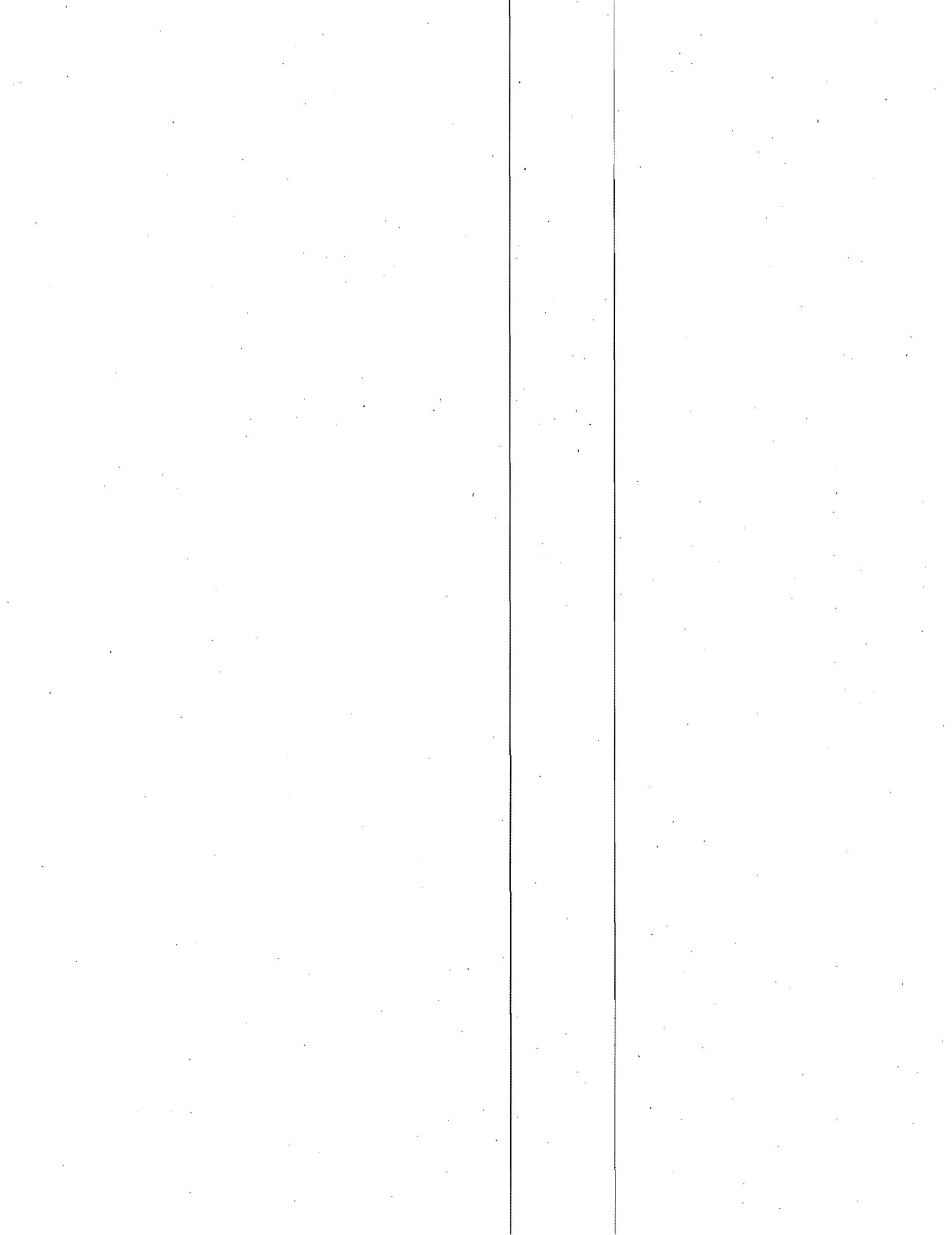
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these, three monitoring wells (OW-6, OW-31, and OW-38) exhibited concentrations exceeding the TPH non drinking water action limit of 1 ppm.

Appendix E contains a summary of groundwater analytical results for samples collected from the perimeter monitoring wells during the most recent and previous semi-annual site status monitoring events. **Figure 6** and **Figure 7**, respectively, illustrate the concentrations of benzene detected during the September 1999 and March 1999 sampling events. **Figure 8** and **Figure 9**, respectively, illustrate the concentrations of TPH (TPH-GRO and EPH, combined) detected during the September 1999 and March 1999 sampling events. Included in **Appendix E** are graphs depicting constituent concentrations over time. Based on review of these graphs, between the March 1999 and September 1999 sampling events:

- Benzene concentrations remained stable or decreased in all of the monitoring wells sampled;
- TPH concentrations remained stable or decreased in OW-15, OW-29, OW-30, OW-31, OW-32, OW-34, OW-38, OW-40, and OW-43; and
- TPH concentrations increased in MW-1, and OW-6.



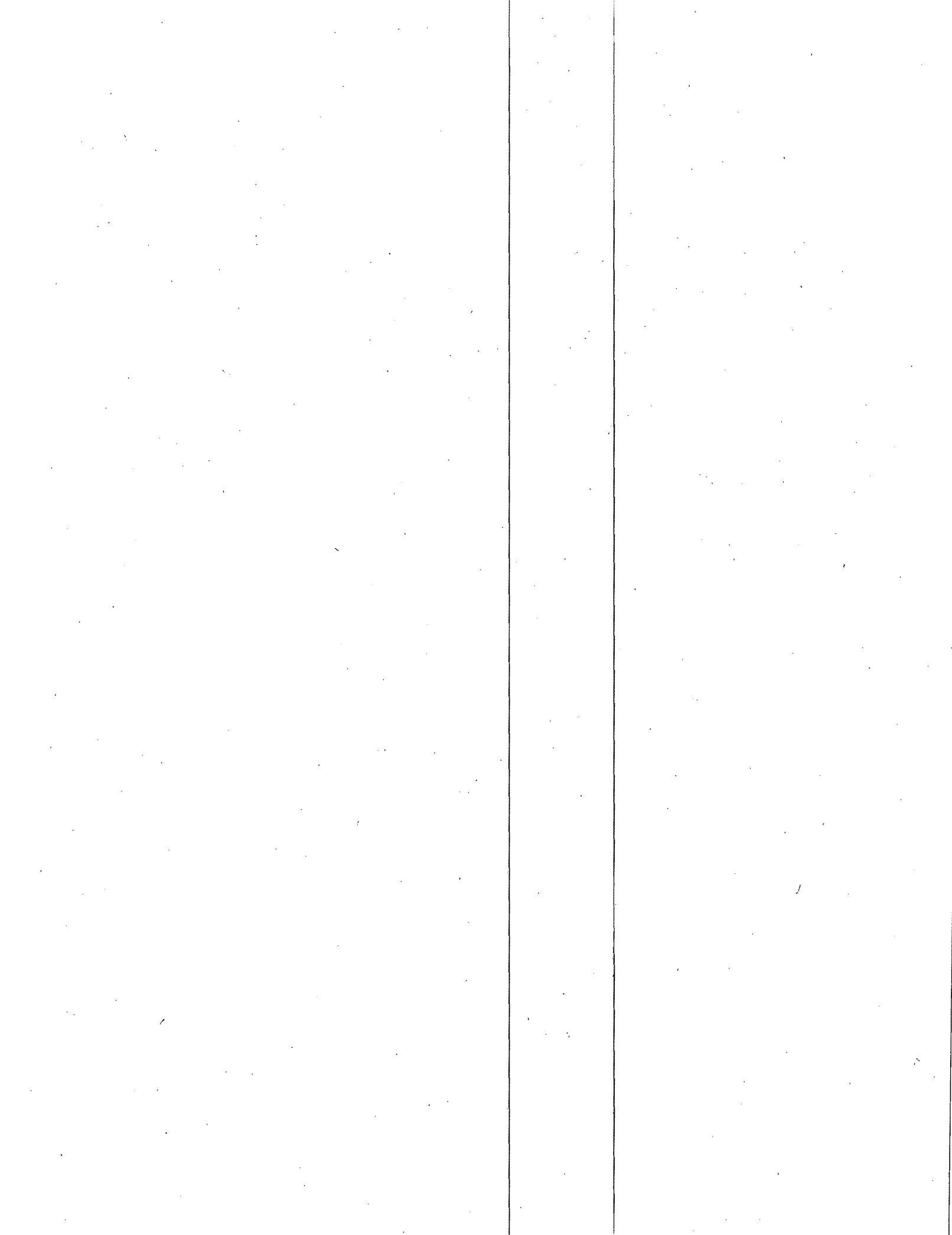
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5.0 Additional Information

As discussed in Section 2.2, monitoring wells OW-29 and OW-34 were abandoned and replacement wells OW-29(R) and OW-34(R) were installed. Installation and abandonment of the wells was performed in accordance with state and local regulations. **Appendix F** contains copies of permits obtained to complete these tasks. Included are permits for earlier well abandonments (RW-7, B-11, and RW-3) and installation (RW-3(R)) that were completed during the previous monitoring period. These permits were received after submittal of the last Site Status Monitoring Report. Well logs for replacement wells OW-29(R), OW-34(R) and RW-3(R) are also included in **Appendix F**.

Auger cuttings generated during installation of replacement wells OW-29(R) and OW-34(R) were containerized in five 55-gallon drums, labeled, and staged onsite. To characterize the waste, a composite soil sample was collected and analyzed for metals, semi-volatile organic compounds and volatile organic compounds by toxic characteristic leachate procedure, and for ignitability. Certificates of Analysis for these samples are included in **Appendix G**. Options for final disposition of the drill cuttings are currently being evaluated.

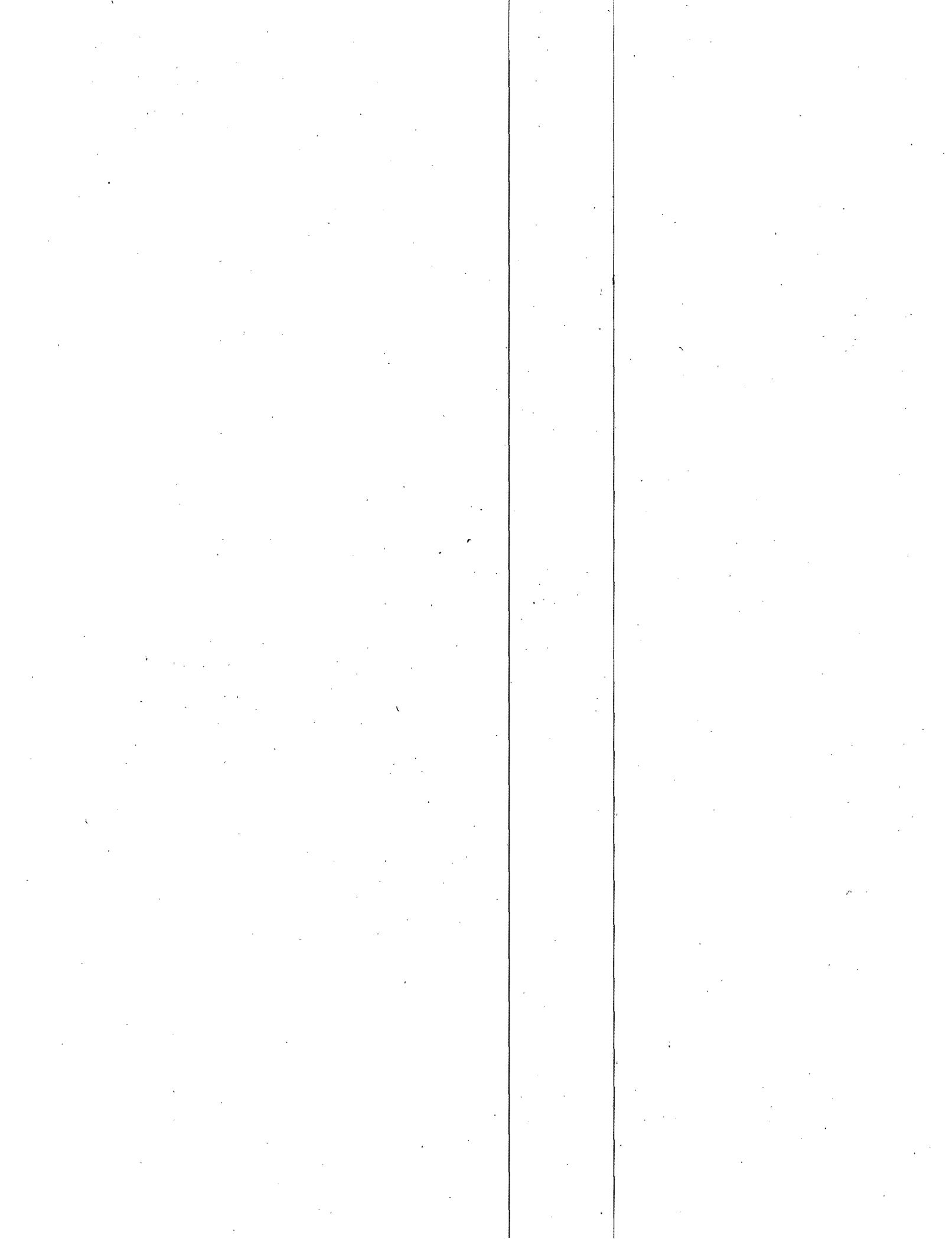


6.0 Conclusions and Recommendations

Based on the monitoring data, it appears the remediation activities at the site have been effective in terms of stabilizing the extent of the dissolved-phase and free-phase product plumes. The following recommended activities are suggested for the coming six-month period.

- Perform LNAPL baildown tests from several wells throughout the apparent LNAPL plume. Data collected from the tests will be analyzed to estimate the thickness of LNAPL in formation and, thereby, provide better estimates of the volume of LNAPL at the site.
- Re-survey the top-of-casing elevations of the site monitoring and recovery wells to ensure accurate representation of groundwater elevation contours and flow directions.
- Complete a thorough review of the information gathered during the survey of the equipment and electrical system at each recovery well. Based on review of this information, formulate and implement measures to mitigate the sporadic downtime associated with the individual recovery wells.
- Investigate the areal extent of LNAPL in the area of OW-27, OW-26 and RW-12.
- Continue routine pump and treat operations and maintenance activities.
- Continue to monitor site-wide liquid levels in all monitoring and recovery wells on a quarterly basis.
- Continue to collect groundwater samples on a semi-annual basis from the previously established perimeter monitoring wells.

A description of the activities performed over the next six-month period, along with the results of these activities, will be included in the next Site Status Monitoring Report.



SEMI-ANNUAL SITE STATUS MONITORING REPORT
Williams Refining, L.L.C.
543 West Mallory Avenue, Memphis, Tennessee

DECEMBER 14, 1999
TDEC FID No. 9-791214
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7.0 Signature Page

I certify under penalty of law, including but not limited to penalties for perjury, that the information contained in this report and on any attachments, is true, accurate and complete to the best of my knowledge, information, and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for intentional violations.

Dale R. Morris

Owner/Operator (Print)

Dale R. Morris

Bruce A. Shaw

PE or PG (Print)

Bruce A. Shaw

Signature/TN License/Registration No.

12/14/99

Date

12/14/99

Date

If a PE signs the report, please indicate the area of expertise.

All signatures above must be notarized.

STATE OF Tennessee

Sworn to and subscribed before me by Dale Morris and Bruce Shaw

on this date December 14, 1999

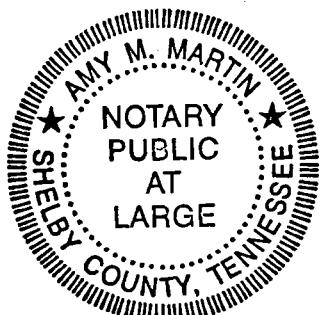
My commission expires My Commission Expires August 13, 2002

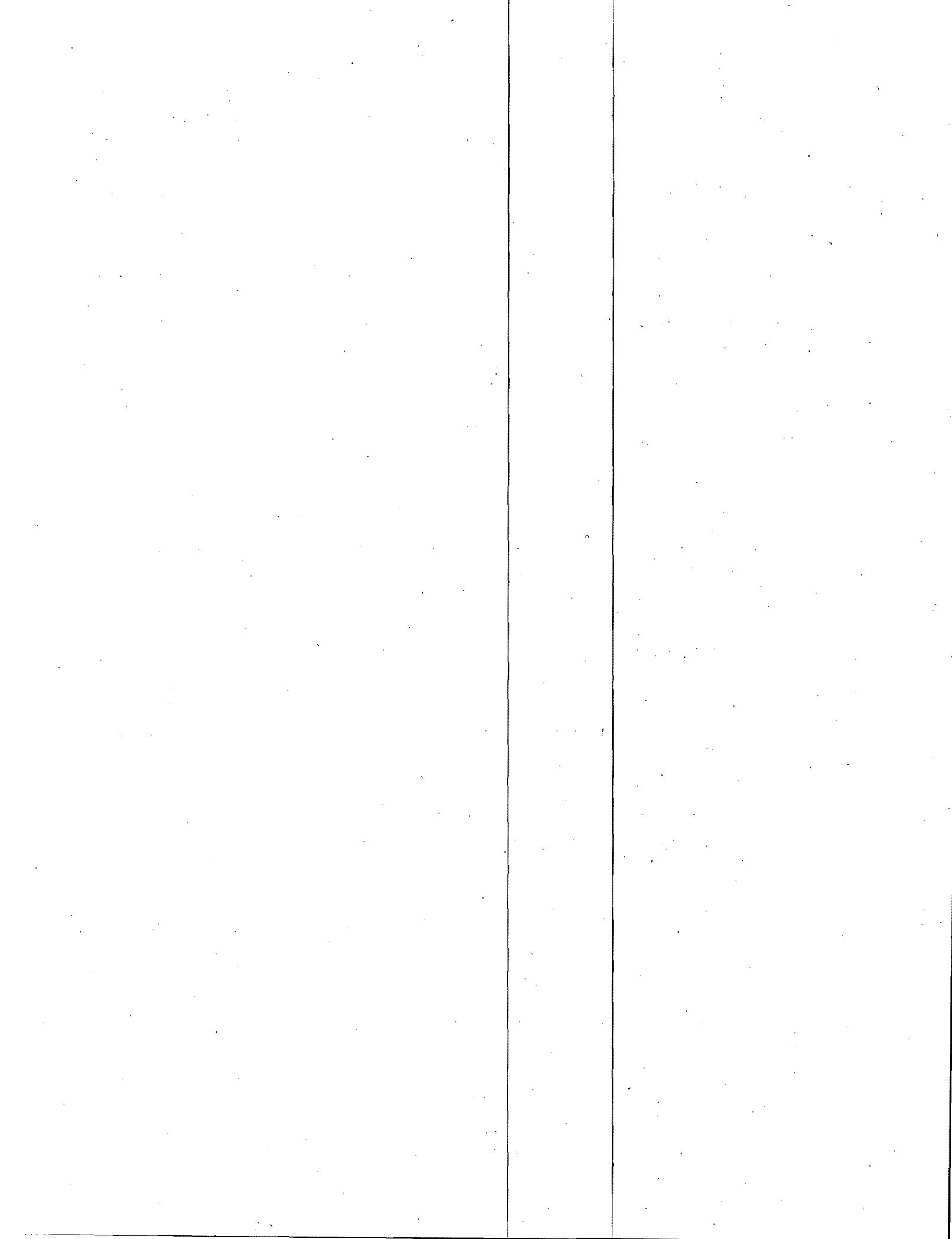
Amy M. Martin

Notary Public (Print Name)

Amy M. Martin

Signature



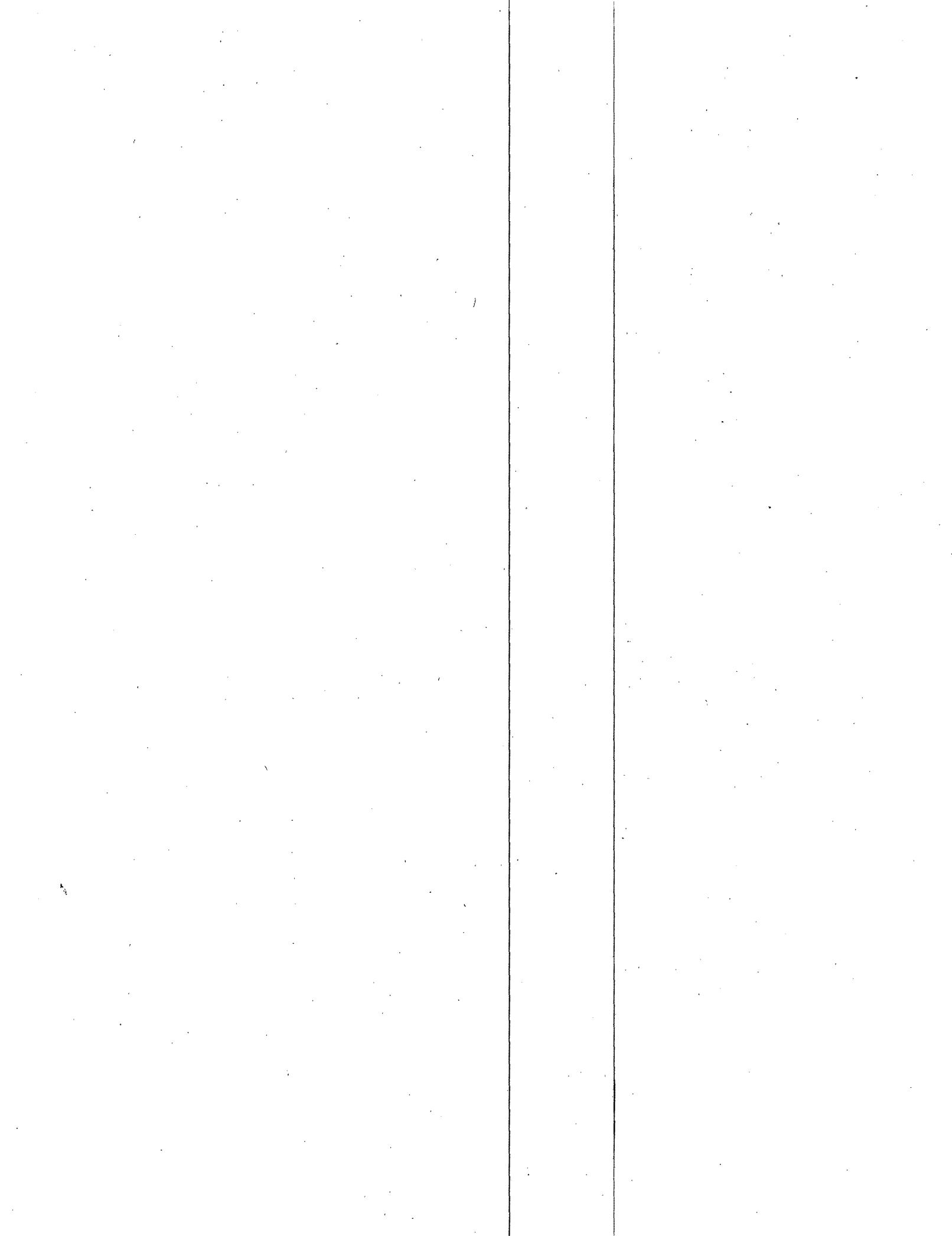


SEMI-ANNUAL SITE STATUS MONITORING REPORT
Williams Refining, L.L.C.
543 West Mallory Avenue, Memphis, Tennessee

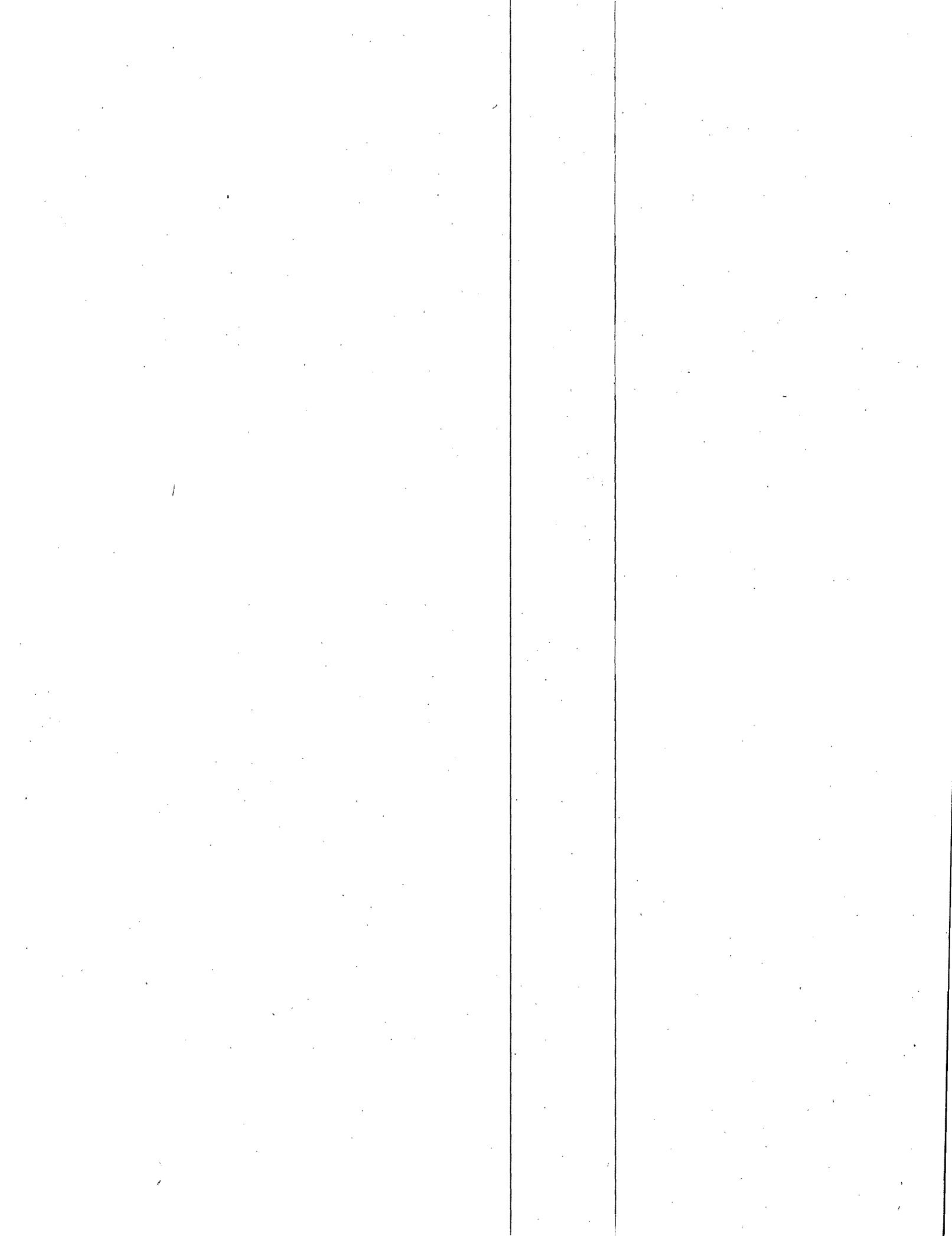
DECEMBER 14, 1999
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Page 8-1

8.0 References

IT Corporation, 1999, *Semi-Annual Site Status Monitoring Report, Williams Refining, L.L.C.*, TDEC Facility ID No. 9-791214, April 1999.



TABLES



TABLES

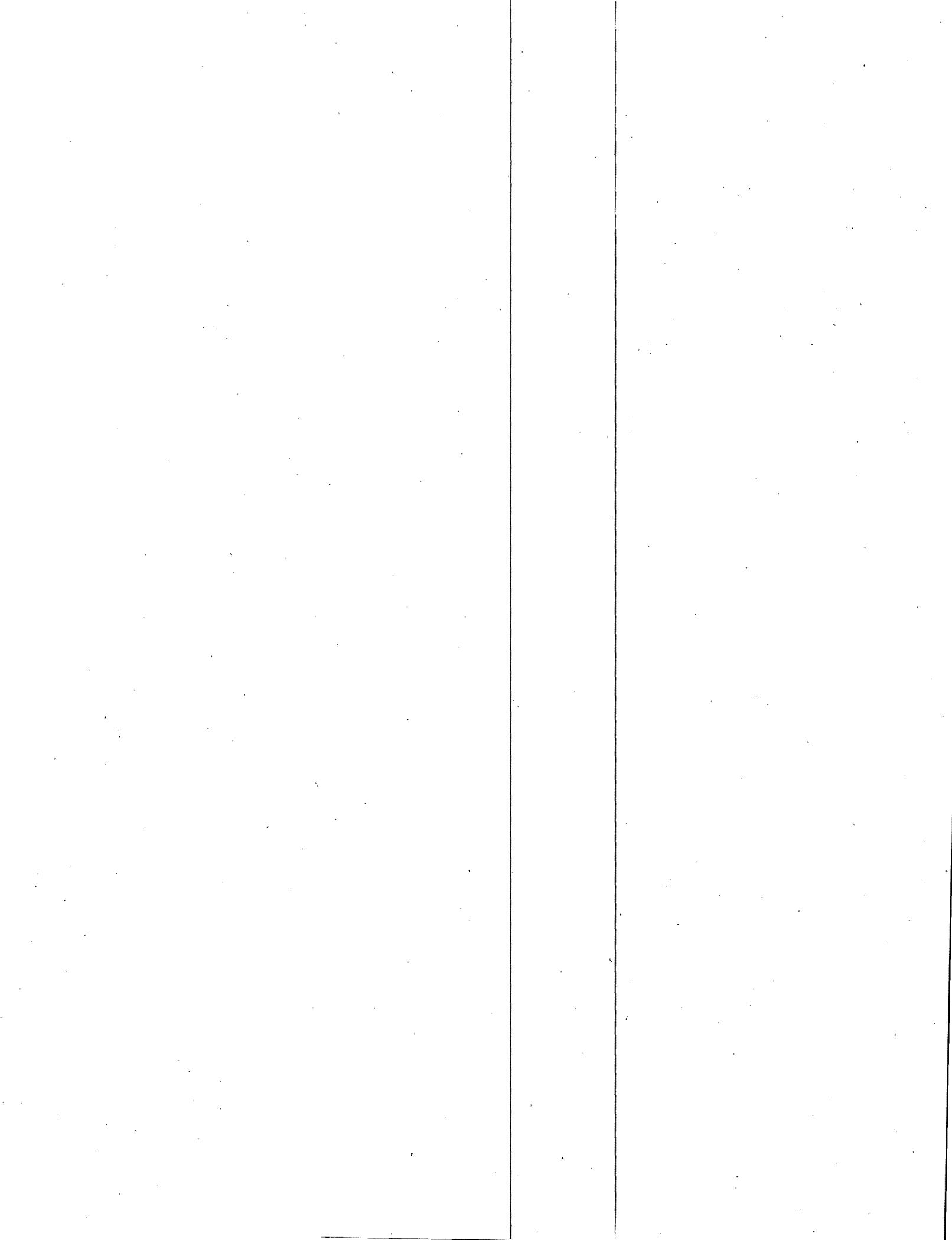


TABLE 1
MONITORING REPORT

Williams Refining, L.L.C.
543 West Mallory Avenue
Memphis, Tennessee

REPORTING PERIOD	FROM:	Oct-96	Apr-97	Oct-97	Apr-98	Oct-98	Apr-99
	TO:	Mar-97	Sep-97	Mar-98	Sep-98	Mar-99	Sep-99
COMBINED FLOW FROM RW-1 THROUGH RW-11							
Average Flow Rate Gallons per minute (gpm)		46	85	51	73.6	27.1	36.5
Total Gallons Pumped Per Period		12,200,000	22,380,000	13,531,468	19,400,000	7,113,905	9,606,000
Cumulative Total Gallons Pumped		66,122,800	88,502,800	102,034,268	121,434,268	128,548,173	138,154,173
Percent Time System was Down		39.9%	4.4%	1.6%	4.4%	8.2%	6.6%
FLOW FROM RW-12							
Average Flow Rate Gallons per minute (gpm)		NA	NA	2	2	1.0	2.1
Total Gallons Pumped Per Period		NA	11,840	527,209	514,708	252,127	565,022
Cumulative Total Gallons Pumped		NA	11,840	539,049	1,053,757	1,305,884	1,870,906
Percent Time System was Down		NA	NA	19.1%	34.4%	63.2%	3.3%
SUM OF ALL RECOVERY WELLS							
Pounds of Benzene Removed - H ₂ O Phase		609	2,364	1,335	1,069	688	856
Cumulative Pounds of Benzene Removed - H ₂ O Phase		4,532	6,896	8,231	9,300	9,988	10,845
Pounds of TPH Removed - H ₂ O Phase		3,756	4,638	9,106	3,808	1,857	1,787
Cumulative Pounds of TPH Removed - H ₂ O Phase		12,023	16,661	25,767	29,575	31,432	33,219
SUMMARY OF LNAPL RECOVERED							
Gallons of LNAPL pumped		32,862	210,391	18,403	14,102	2,424	1,658
Cumulative gallons of LNAPL pumped		1,771,352	1,981,743	2,000,146	2,014,248	2,016,672	2,018,330

The reporting period described is a 6-month interval.

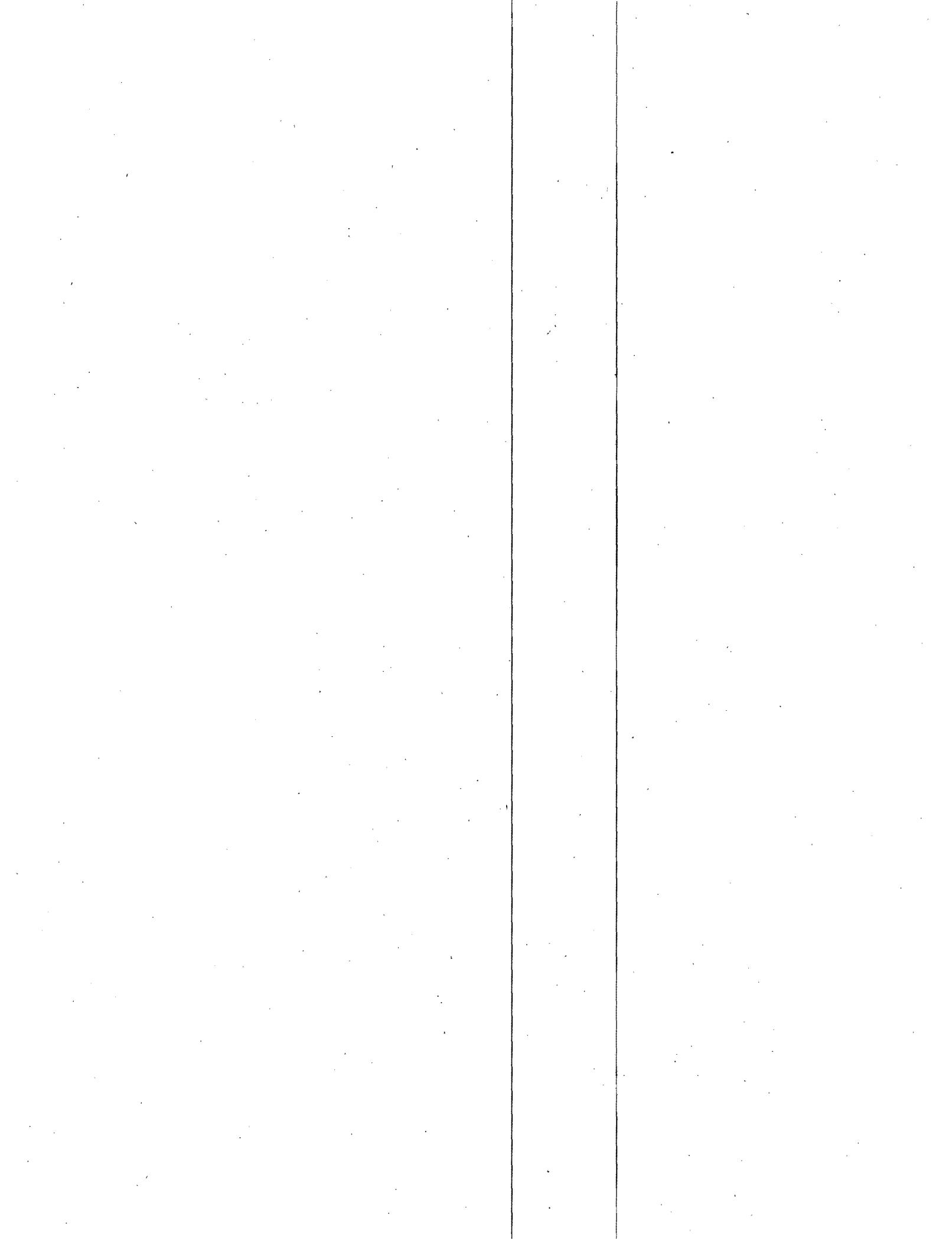


TABLE 2
PRODUCT RECOVERY SYSTEM REPORT
APRIL 1, 1999 THROUGH SEPTEMBER 30, 1999

Williams Refining, L.L.C.
543 West Mallory Avenue
Memphis, Tennessee
TDEC FID No. 9-791214

WELL ID	PREVIOUS GALLONS BEFORE 04/01/99	TOTAL GALLONS PUMPED 04/01/99 - 09/30/99	TOTAL GALLONS AS OF 09/30/99
RW-1	554,280	1	554,281
RW-2	1,779	0	1,779
RW-3	9,845	6	9,851
RW-4	760,039	50	760,089
RW-5	133,602	0	133,602
RW-6	263,684	0	263,684
RW-7	645	0	645
RW-8	1,390	7	1,397
RW-12	46,166	6	46,172
B-5	2,351	4	2,355
B-7	502	3	505
B-8	7,762	152	7,914
OW-27	2,228	480	2,708
OW-39	1,227	96	1,323
G-3	3,175	140	3,315
G-5	1,182	79	1,261
OTHER	1,724	34	1,758
SUBTOTAL FROM WELLS	1,791,581	1,058	1,792,639
FRENCH DRAINS	225,096	600	225,696
TOTAL	2,016,677	1,658	2,018,335

"Other" comprises the sum of the product recovered from monitoring wells B-1, B-2, G-1, RW-10, OW-12, OW-14, OW-16, OW-17, OW-22, OW-23, OW-24 and OW-36

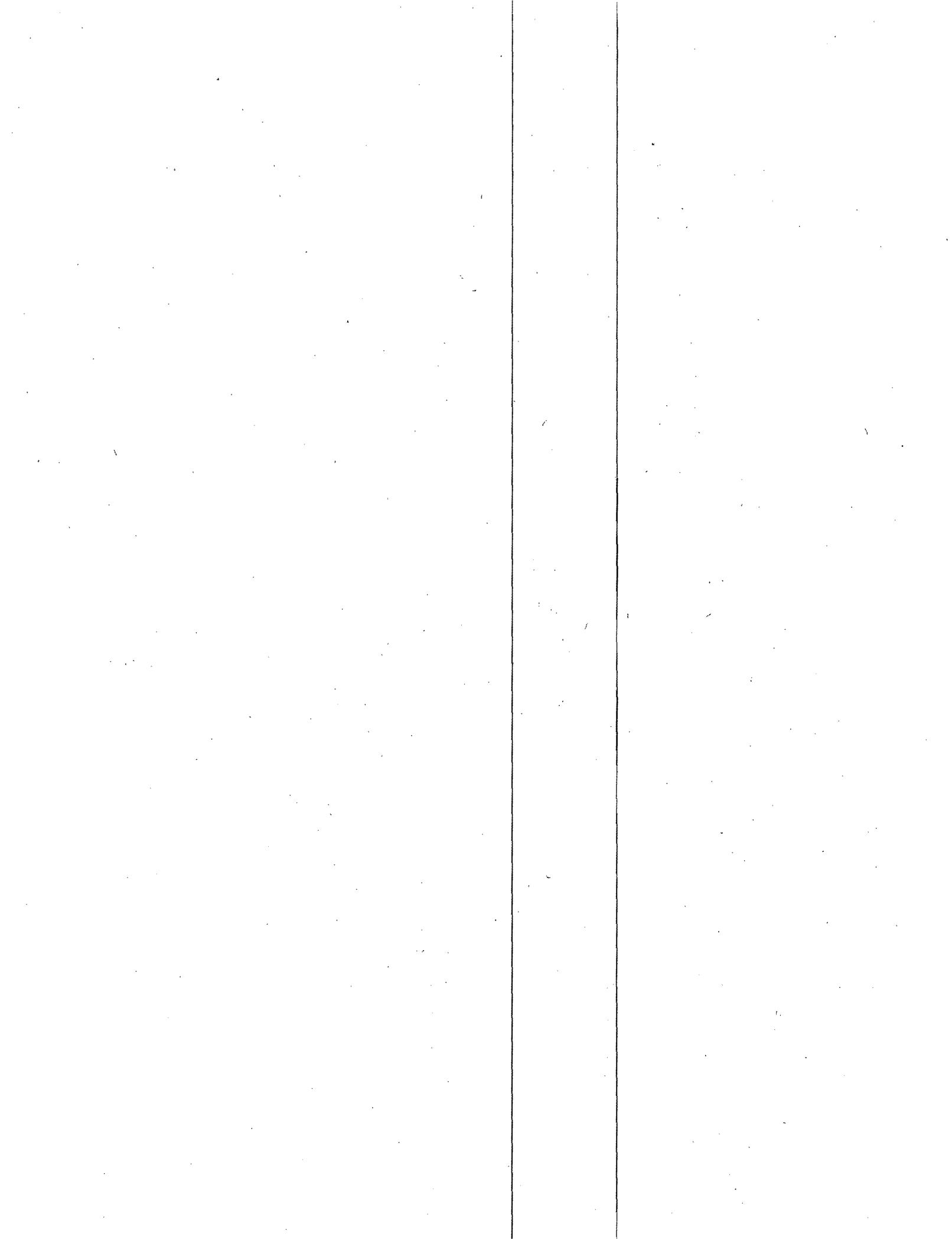


TABLE 3
SUMMARY OF POTENTIOMETRIC ELEVATION DATA
QUARTER 2, 1999

Williams Refining, L.L.C.
543 West Mallory
Memphis, Tennessee
TDEC FID No. 9-791214

WELL ID	MONITORING DATE	MEASUREMENTS IN FEET						
		TOC ELEVATION	WELL DEPTH	DEPTH TO WATER	DEPTH TO PSH	PSH THICKNESS	PSH SPECIFIC GRAVITY	GROUNDWATER ELEVATION
OW-2	6/30/99	227.76	60.00	29.04	ND	ND	NA	198.72
OW-6	6/30/99	227.77	45.00	26.98	ND	ND	NA	200.79
OW-9	6/30/99	223.47	60.00	19.33	ND	ND	NA	204.14
OW-11	6/30/99	223.53	60.00	19.41	ND	ND	NA	204.12
OW-12	6/30/99	225.78	60.00	23.97	23.25	0.72	0.8468	202.42
OW-13	6/30/99	226.15	60.00	24.00	ND	ND	NA	202.15
OW-14	6/30/99	216.78	55.00	7.25	7.23	0.02	0.8265	209.55
OW-15	6/30/99	224.11	60.00	19.39	ND	ND	NA	204.72
OW-16	6/30/99	223.88	60.00	23.91	23.01	0.90	0.8468	200.73
OW-17	6/30/99	221.23	65.00	22.62	ND	ND	NA	198.61
OW-18	6/30/99	227.08	65.00	28.48	ND	ND	NA	198.60
OW-20	6/30/99	232.94	65.00	37.56	ND	ND	NA	195.38
OW-21	6/30/99	235.14	65.00	38.91	ND	ND	NA	196.23
OW-22	6/30/99	234.21	65.00	39.10	38.17	0.93	0.8000	195.85
OW-23	6/30/99	234.60	65.00	37.50	37.49	0.01	0.8000	197.11
OW-24	6/30/99	240.19	65.00	45.78	45.57	0.21	0.8000	194.58
OW-25	6/30/99	239.83	65.00	46.98	ND	ND	NA	192.85
OW-26	6/30/99	217.48	60.00	10.82	ND	ND	NA	206.66
OW-27	6/30/99	218.64	63.00	27.55	7.60	19.95	0.7420	205.89
OW-29	6/30/99	231.06	70.00	32.90	ND	ND	NA	198.16
OW-30	6/30/99	235.28	70.00	41.65	ND	ND	NA	193.63
OW-31	6/30/99	228.04	75.00	35.15	ND	ND	NA	192.89
OW-32	6/30/99	226.74	70.00	32.83	ND	ND	NA	193.91
OW-33	6/30/99	223.75	70.50	17.65	ND	ND	NA	206.10
OW-34	6/30/99	219.39	60.00	16.30	ND	ND	NA	203.09
OW-35	6/30/99	215.19	60.00	12.93	ND	ND	NA	202.26
OW-36	6/30/99	218.70	73.00	8.93	8.15	0.78	0.7999	210.39
OW-37	6/30/99	217.40	71.50	14.51	ND	ND	NA	202.89
OW-38	6/30/99	216.32	70.00	12.35	ND	ND	NA	203.97
OW-39	6/30/99	232.81	70.00	37.18	28.35	8.83	0.8713	203.32
OW-40	6/30/99	244.06	70.00	40.48	ND	ND	NA	203.58
OW-42	6/30/99	241.65	74.00	48.75	ND	ND	NA	192.90
OW-43	6/30/99	238.42	70.00	46.00	ND	ND	NA	192.42
OW-44	6/30/99	238.55	70.00	45.03	ND	ND	NA	193.52
OW-45	6/30/99	223.94	58.00	17.02	ND	ND	NA	206.92
B-1	6/30/99	219.92	31.00	20.53	20.15	0.38	0.7788	199.69
B-2	6/30/99	219.72	42.00	21.85	20.70	1.15	0.7788	198.77
B-5	6/30/99	223.01	37.00	24.72	24.08	0.64	0.7788	198.79
B-6	6/30/99	222.36	37.00	23.34	ND	ND	NA	199.02
B-7	6/30/99	223.85		24.42	23.95	0.47	0.7788	199.80

GAUGING NOTES

TOC:	Top of well casing	ND:	Not detected in well
PSH:	Phase separated hydrocarbons	NG:	Well not gauged
Source:	S. Keville (IT Corporation) / J. Rhodes (Williams) (6/30/99)		

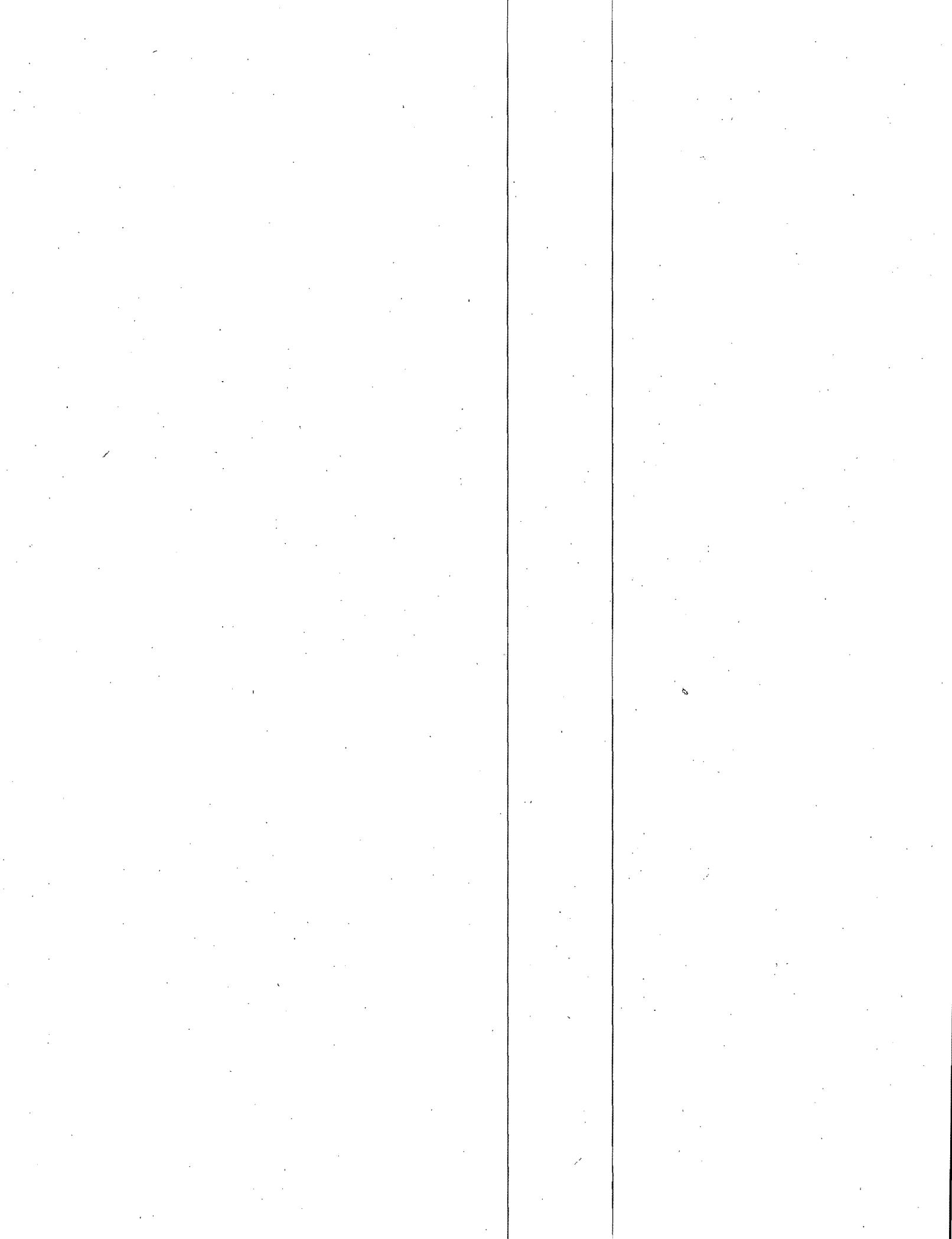


TABLE 3 (Continued)
SUMMARY OF POTENTIOMETRIC AND GROUNDWATER QUALITY DATA

Williams Refining, L.L.C.
543 West Mallory
Memphis, Tennessee
TDEC FID No. 9-791214

WELL ID	MONITORING DATE	MEASUREMENTS IN FEET						
		TOC ELEVATION	WELL DEPTH	DEPTH TO WATER	DEPTH TO PSH	PSH THICKNESS	PSH SPECIFIC GRAVITY	GROUNDWATER ELEVATION
B-8	6/30/99	226.43		33.55	26.72	6.83	0.7788	198.20
B-9	6/30/99	224.97		30.63	29.88	0.75	0.8008	194.94
B-10	6/30/99	217.35		21.95	21.94	0.01	0.8000	195.41
B-11	6/30/99	WELL ABANDONED - 12/98						
B-13	6/30/99	235.19		37.10	ND	ND	NA	198.09
B-15	6/30/99	233.87		40.25	37.52	2.73	0.8000	195.80
MW-1	6/30/99	224.35		26.05	ND	ND	NA	198.30
MW-2	6/30/99	224.83		25.29	ND	ND	NA	199.54
G-1	6/30/99	217.76		18.07	ND	ND	NA	199.69
G-2	6/30/99	217.37		10.64	10.60	0.04	0.7999	206.76
G-3	6/30/99	216.24		13.75	12.14	1.61	0.7905	203.76
G-4	6/30/99	219.98		19.46	ND	ND	NA	200.52
G-5	6/30/99	232.70		22.67	20.67	2.00	0.8328	211.70
RW-1	6/30/99	226.50	78.00	32.64	32.56	0.08	0.8468	193.93
RW-2	6/30/99	218.76		19.03	ND	ND	NA	199.73
RW-3	6/30/99	WELL ABANDONED - 03/99						
RW-3(R)	6/30/99	227.13		33.87	33.59	0.28	0.8008	193.48
RW-4	6/30/99	219.69		24.05	23.43	0.62	0.7788	196.12
RW-5	6/30/99	221.14	63.00	24.93	24.91	0.02	0.7788	196.23
RW-6	6/30/99	219.62	75.00	21.77	ND	ND	NA	197.85
RW-7	6/30/99	WELL ABANDONED - 12/98						
RW-8	6/30/99	217.60	50	24.70	23.75	0.95	0.8265	193.69
RW-9	6/30/99	242.90		51.00	ND	ND	NA	191.90
RW-10	6/30/99	239.70		48.79	48.51	0.28	0.8000	191.13
RW-11	6/30/99	234.50		47.10	ND	ND	NA	187.40
RW-12	6/30/99	219.16	61	36.50	36.00	0.50	0.7420	183.03

GAUGING NOTES

- | | | | |
|---------|--------------------------------------------------------------|-----|----------------------|
| TOC: | Top of well casing | ND: | Not detected in well |
| PSH: | Phase separated hydrocarbons | NG: | Well not gauged |
| Source: | S. Keville (IT Corporation) / J. Rhodes (Williams) (6/30/99) | | |

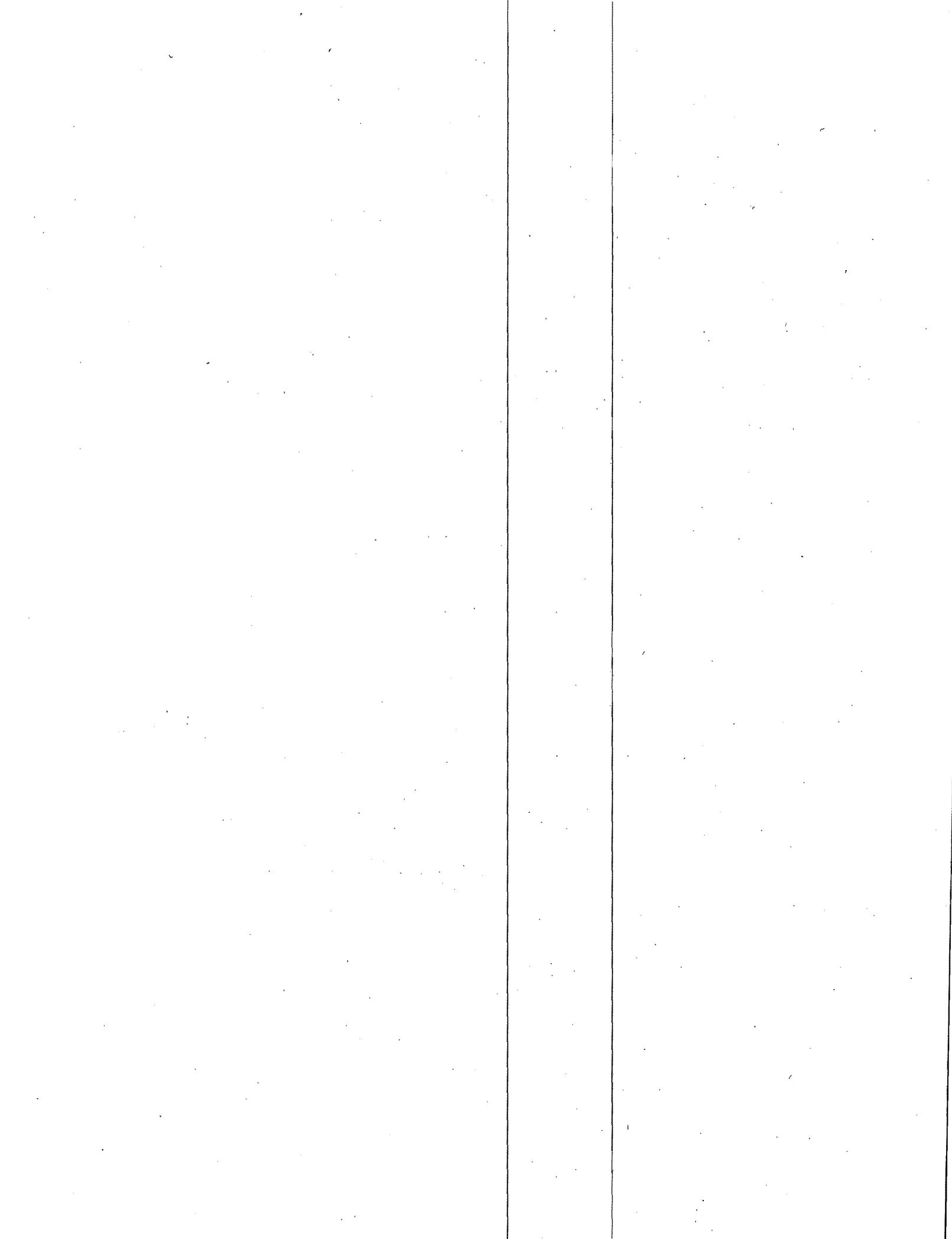


TABLE 4
SUMMARY OF POTENTIOMETRIC AND GROUNDWATER QUALITY DATA

Williams Refining, L.L.C.
543 West Mallory
Memphis, Tennessee
TDEC FID No. 9-791214

WELL ID	MONITORING DATE	MEASUREMENTS IN FEET							CONCENTRATIONS IN PPM			
		TOC ELEVATION	WELL DEPTH	DEPTH TO WATER	DEPTH TO PSH	PSH THICKNESS	PSH SPECIFIC GRAVITY	GROUNDWATER ELEVATION	BENZENE	GRO	EPH	TOTAL TPH
OW-2	9/27/99	227.76	60.00	37.74	ND	ND	NA	190.02	NS	NS	NS	NS
OW-6	9/27/99	227.77	45.00	33.43	ND	ND	NA	194.34	ND	0.2	2.79	2.99
OW-9	9/27/99	223.47	60.00	25.50	ND	ND	NA	197.97	NS	NS	NS	NS
OW-11	9/27/99	223.53	60.00	25.16	24.90	0.26	0.8468	198.59	NS	NS	NS	NS
OW-12	9/27/99	225.78	60.00	29.30	29.05	0.25	0.8468	196.69	NS	NS	NS	NS
OW-13	9/27/99	226.15	60.00	28.87	ND	ND	NA	197.28	NS	NS	NS	NS
OW-14	9/27/99	216.78	55.00	17.75	17.66	0.09	0.8265	199.10	NS	NS	NS	NS
OW-15	9/27/99	224.11	60.00	24.55	ND	ND	NA	199.56	0.0038	ND	0.19	0.19
OW-16	9/27/99	223.88	60.00	28.46	27.73	0.73	0.8468	196.04	NS	NS	NS	NS
OW-17	9/27/99	221.23	65.00	29.90	29.50	0.40	0.8000	191.65	NS	NS	NS	NS
OW-18	9/27/99	227.08	65.00	35.13	ND	ND	NA	191.95	NS	NS	NS	NS
OW-20	9/27/99	232.94	65.00	46.40	ND	ND	NA	186.54	NS	NS	NS	NS
OW-21	9/27/99	235.14	65.00	49.36	ND	ND	NA	185.78	NS	NS	NS	NS
OW-22	9/27/99	234.21	65.00	49.16	49.05	0.11	0.8000	185.14	NS	NS	NS	NS
OW-23	9/27/99	234.60	65.00	48.05	47.84	0.21	0.8000	186.72	NS	NS	NS	NS
OW-24	9/27/99	240.19	65.00	56.35	56.20	0.15	0.8000	183.96	NS	NS	NS	NS
OW-25	9/27/99	239.83	65.00	57.59	ND	ND	NA	182.24	NS	NS	NS	NS
OW-26	9/27/99	217.48	60.00	14.97	ND	ND ^[1]	NA	202.51	NS ^[1]	NS ^[1]	NS ^[1]	NS ^[1]
OW-27	9/27/99	218.64	63.00	27.93	14.47	13.46	0.7420	200.70	NS	NS	NS	NS
OW-29	9/27/99	WELL ABANDONED - 09/99										
OW-29[R]	9/27/99	233.00	60.00	49.09	ND	ND	NA	183.91	0.001	ND	0.46	0.46

GAUGING NOTES

- TOC: Top of well casing
 PSH: Phase separated hydrocarbons
 ND: Not detected in well
 NG: Well not gauged
 Source: W. Connolly & T. Campbell (IT Corp.) / J. Rhodes (Williams) (9/27 & 28/99)
 [1]: In OW-26, LNAPL was not detected prior to purging the well to facilitate the collection of a groundwater sample. After purging the well, approximately 0.35 feet of LNAPL had accumulated. Therefore, this well was not sampled.

LABORATORY DATA NOTES

- GRO: Gasoline range hydrocarbons by Tennessee Method
 EPH: Extractable petroleum hydrocarbons by Tennessee Method
 TPH: Total petroleum hydrocarbons
 TOTAL TPH: Sum total of GRO concentration and EPH concentration
 NS: Well not sampled
 NA: Sample not analyzed for constituent
 ND: Constituent not detected in sample
 Source: Specialized Assays, Inc., Nashville, TN (10/99)

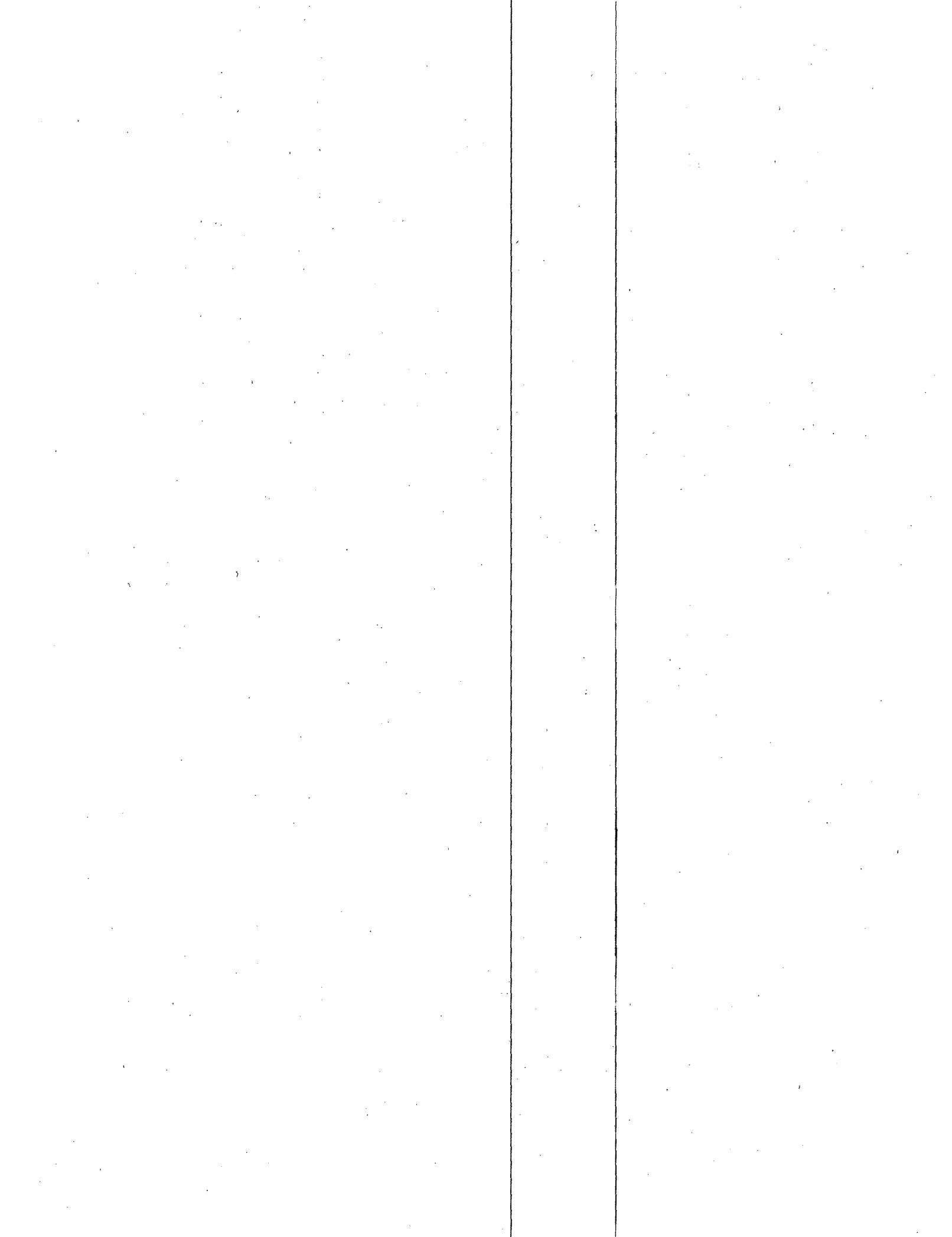


TABLE 4 (Continued)
SUMMARY OF POTENTIOMETRIC AND GROUNDWATER QUALITY DATA

Williams Refining, L.L.C.
 543 West Mallory
 Memphis, Tennessee
 TDEC FID No. 9-791214

WELL ID	MONITORING DATE	MEASUREMENTS IN FEET							CONCENTRATIONS IN PPM			
		TOC ELEVATION	WELL DEPTH	DEPTH TO WATER	DEPTH TO PSH	PSH THICKNESS	PSH SPECIFIC GRAVITY	GROUNDWATER ELEVATION	BENZENE	GRO	EPH	TOTAL TPH
OW-30	9/27/99	235.28	70.00	51.91	ND	ND	NA	183.37	ND	ND	0.31	0.31
OW-31	9/27/99	228.04	75.00	46.99	ND	ND	NA	181.05	1.964	4.48	2.04	6.52
OW-32	9/27/99	226.74	70.00	46.49	ND	ND	NA	180.25	ND	ND	0.34	0.34
OW-33	9/27/99	223.75	70.50	22.33	ND	ND	NA	201.42	NS	NS	NS	NS
OW-34	9/27/99	WELL ABANDONED - 09/99										
OW-34[R]	9/27/99	218.31	35.00	18.85	ND	ND	NA	199.46	ND	ND	ND	ND
OW-35	9/27/99	215.19	60.00	17.28	ND	ND	NA	197.91	NS	NS	NS	NS
OW-36	9/27/99	218.70	73.00	19.00	18.40	0.60	0.7999	200.18	NS	NS	NS	NS
OW-37	9/27/99	217.40	71.50	20.47	ND	ND	NA	196.93	NS	NS	NS	NS
OW-38	9/27/99	216.32	70.00	18.18	ND	ND	NA	198.14	0.0128	0.34	5.25	5.59
OW-39	9/27/99	232.81	70.00	38.50	37.92	0.58	0.8713	194.82	NS	NS	NS	NS
OW-40	9/27/99	244.06	70.00	47.21	ND	ND	NA	196.85	ND	ND	ND	ND
OW-42	9/27/99	241.65	74.00	59.20	ND	ND	NA	182.45	NS	NS	NS	NS
OW-43	9/27/99	238.42	70.00	57.42	ND	ND	NA	181.00	0.0081	ND	0.37	0.37
OW-44	9/27/99	238.55	70.00	54.52	ND	ND	NA	184.03	0.0068	0.43	0.42	0.85
OW-45	9/27/99	223.94	58.00	21.34	ND	ND	NA	202.60	NS	NS	NS	NS
B-1	9/27/99	219.92	31.00	29.72	28.85	0.87	0.7788	190.88	NS	NS	NS	NS
B-2	9/27/99	219.72	42.00	29.29	29.12	0.17	0.7788	190.56	NS	NS	NS	NS
B-5	9/27/99	223.01	37.00	33.05	32.55	0.50	0.7788	190.35	NS	NS	NS	NS
B-6	9/27/99	222.36	37.00	32.68	ND	ND	NA	189.68	NS	NS	NS	NS
B-7	9/27/99	223.85		31.32	30.96	0.36	0.7788	192.81	NS	NS	NS	NS

GAUGING NOTES

- TOC: Top of well casing
 PSH: Phase separated hydrocarbons
 ND: Not detected in well
 NG: Well not gauged
 Source: W. Connolly & T. Campbell (IT Corp.) / J. Rhodes (Williams) (9/27 & 28/99)

LABORATORY DATA NOTES

- GRO: Gasoline range hydrocarbons by Tennessee Method
 EPH: Extractable petroleum hydrocarbons by Tennessee Method
 TPH: Total petroleum hydrocarbons
 TOTAL TPH: Sum total of GRO concentration and EPH concentration
 NS: Well not sampled
 NA: Sample not analyzed for constituent
 ND: Constituent not detected in sample
 Source: Specialized Assays, Inc., Nashville, TN (10/99)

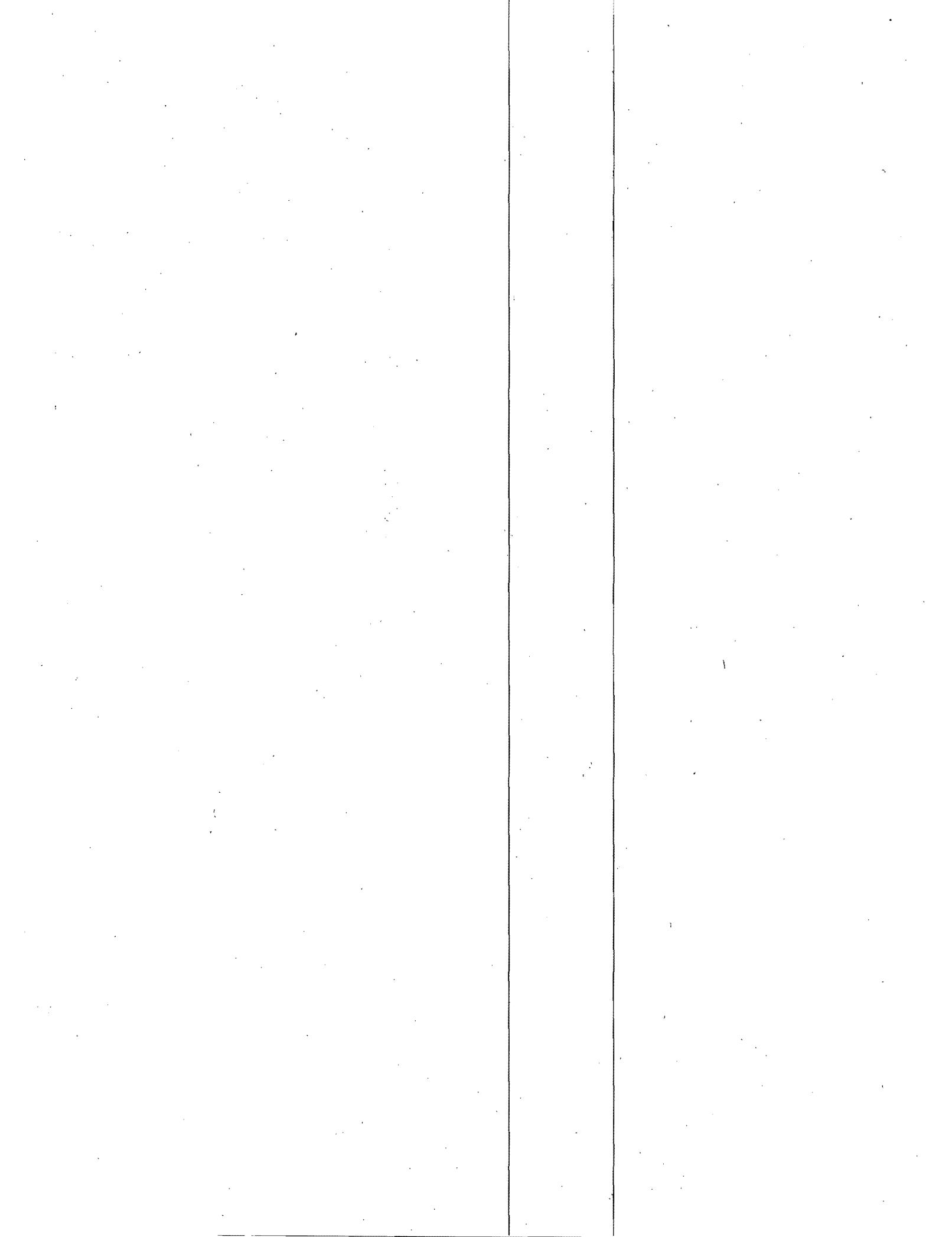


TABLE 4 (Continued)
SUMMARY OF POTENTIOMETRIC AND GROUNDWATER QUALITY DATA

Williams Refining, L.L.C.
 543 West Mallory
 Memphis, Tennessee
 TDEC FID No. 9-791214

WELL ID	MONITORING DATE	MEASUREMENTS IN FEET							CONCENTRATIONS IN PPM			
		TOC ELEVATION	WELL DEPTH	DEPTH TO WATER	DEPTH TO PSH	PSH THICKNESS	PSH SPECIFIC GRAVITY	GROUNDWATER ELEVATION	BENZENE	GRO	EPH	TOTAL TPH
B-8	9/27/99	226.43		Dry	Dry	Dry	0.7788	Dry	NS	NS	NS	NS
B-9	9/27/99	224.97		36.85	36.63	0.22	0.8008	188.30	NS	NS	NS	NS
B-10	9/27/99	217.35		31.78	ND	ND	0.8000	185.57	NS	NS	NS	NS
B-11	9/27/99	WELL ABANDONED - 12/98										
B-13	9/27/99	235.19		44.51	ND	ND	NA	190.68	NS	NS	NS	NS
B-15	9/27/99	233.87		45.29	ND	ND	0.8000	188.58	NS	NS	NS	NS
MW-1	9/27/99	224.35		36.71	ND	ND	NA	187.64	0.0047	ND	0.34	0.34
MW-2	9/27/99	224.83		36.17	ND	ND	NA	188.66	NS	NS	NS	NS
G-1	9/27/99	217.76		26.06	25.00	1.06	0.8265	192.58	NS	NS	NS	NS
G-2	9/27/99	217.37		19.34	ND	ND	0.7999	198.03	NS	NS	NS	NS
G-3	9/27/99	216.24		22.11	17.34	4.77	0.7905	197.90	NS	NS	NS	NS
G-4	9/27/99	219.98		31.87	ND	ND	NA	188.11	NS	NS	NS	NS
G-5	9/27/99	232.70		33.11	31.10	2.01	0.8328	201.26	NS	NS	NS	NS
RW-1	9/27/99	226.50	78.00	40.82	40.78	0.04	0.8468	185.71	NS	NS	NS	NS
RW-2	9/27/99	218.76		30.86	ND	ND	NA	187.90	NS	NS	NS	NS
RW-3	9/27/99	WELL ABANDONED - 03/99										
RW-3(R)	9/27/99	227.13		43.51	42.71	0.80	0.8008	184.26	NS	NS	NS	NS
RW-4	9/27/99	219.69		33.00	31.90	1.10	0.7788	187.55	NS	NS	NS	NS
RW-5	9/27/99	221.14	63.00	31.65	ND	ND	0.7788	189.49	NS	NS	NS	NS
RW-6	9/27/99	219.62	75.00	43.26	43.25	0.01	0.7788	176.37	NS	NS	NS	NS

GAUGING NOTES

TOC: Top of well casing
 PSH: Phase separated hydrocarbons
 ND: Not detected in well
 NG: Well not gauged.
 Source: W. Connolly & T. Campbell (IT Corp.) / J. Rhodes (Williams) (9/27 & 28/99)

LABORATORY DATA NOTES

GRO: Gasoline range hydrocarbons by Tennessee Method
 EPH: Extractable petroleum hydrocarbons by Tennessee Method
 TPH: Total petroleum hydrocarbons
 TOTAL TPH: Sum total of GRO concentration and EPH concentration
 NS: Well not sampled
 NA: Sample not analyzed for constituent
 ND: Constituent not detected in sample
 Source: Specialized Assays, Inc., Nashville, TN (10/99)

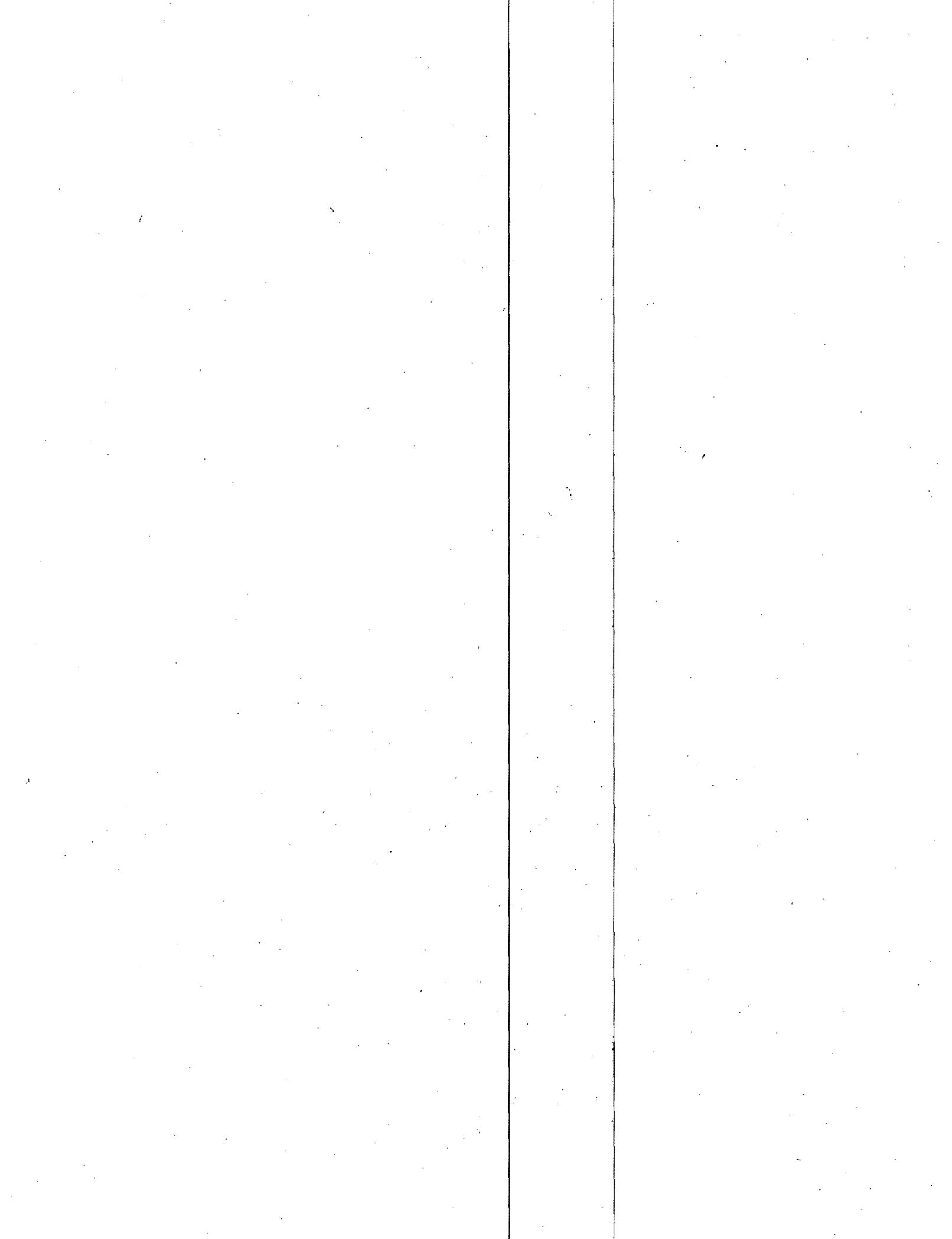


TABLE 4 (Continued)
SUMMARY OF POTENTIOMETRIC AND GROUNDWATER QUALITY DATA

Williams Refining, L.L.C.
 543 West Mallory
 Memphis, Tennessee
 TDEC FID No. 9-791214

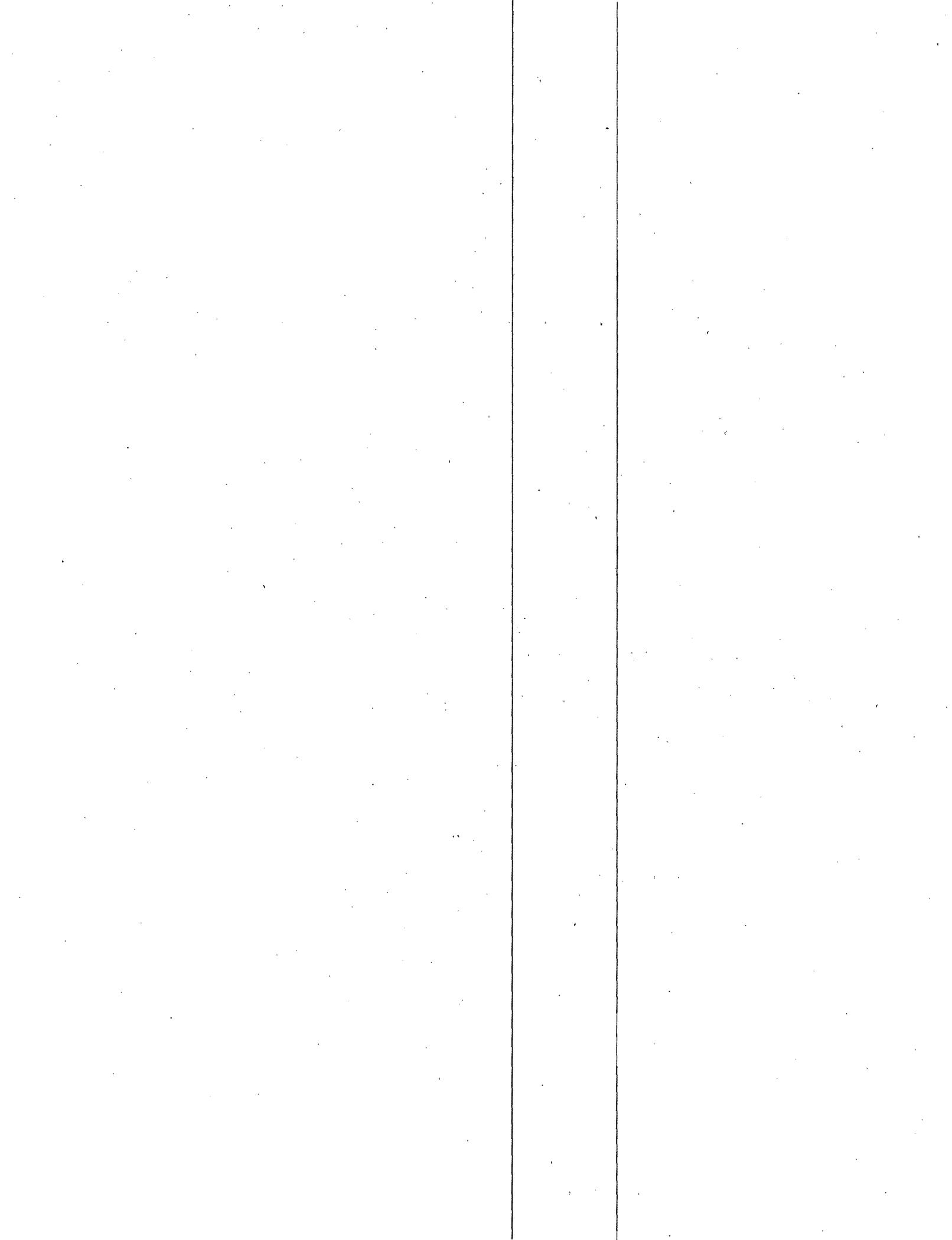
WELL ID	MONITORING DATE	MEASUREMENTS IN FEET							CONCENTRATIONS IN PPM			
		TOC ELEVATION	WELL DEPTH	DEPTH TO WATER	DEPTH TO PSH	PSH THICKNESS	PSH SPECIFIC GRAVITY	GROUNDWATER ELEVATION	BENZENE	GRO	EPH	TOTAL TPH
RW-7	9/27/99	WELL ABANDONED - 12/98										
RW-8	9/27/99	217.60	50	23	22.5	0.5	0.8265	195.01	NS	NS	NS	NS
RW-9	9/27/99	242.90		53.54	ND	ND	NA	189.36	NS	NS	NS	NS
RW-10	9/27/99	239.70		52.39	52.38	0.01	0.8000	187.32	NS	NS	NS	NS
RW-11	9/27/99	234.50		49.05	ND	ND	NA	185.45	NS	NS	NS	NS
RW-12	9/27/99	219.16	61	34.16	ND	ND	0.7420	185.00	NS	NS	NS	NS

GAUGING NOTES

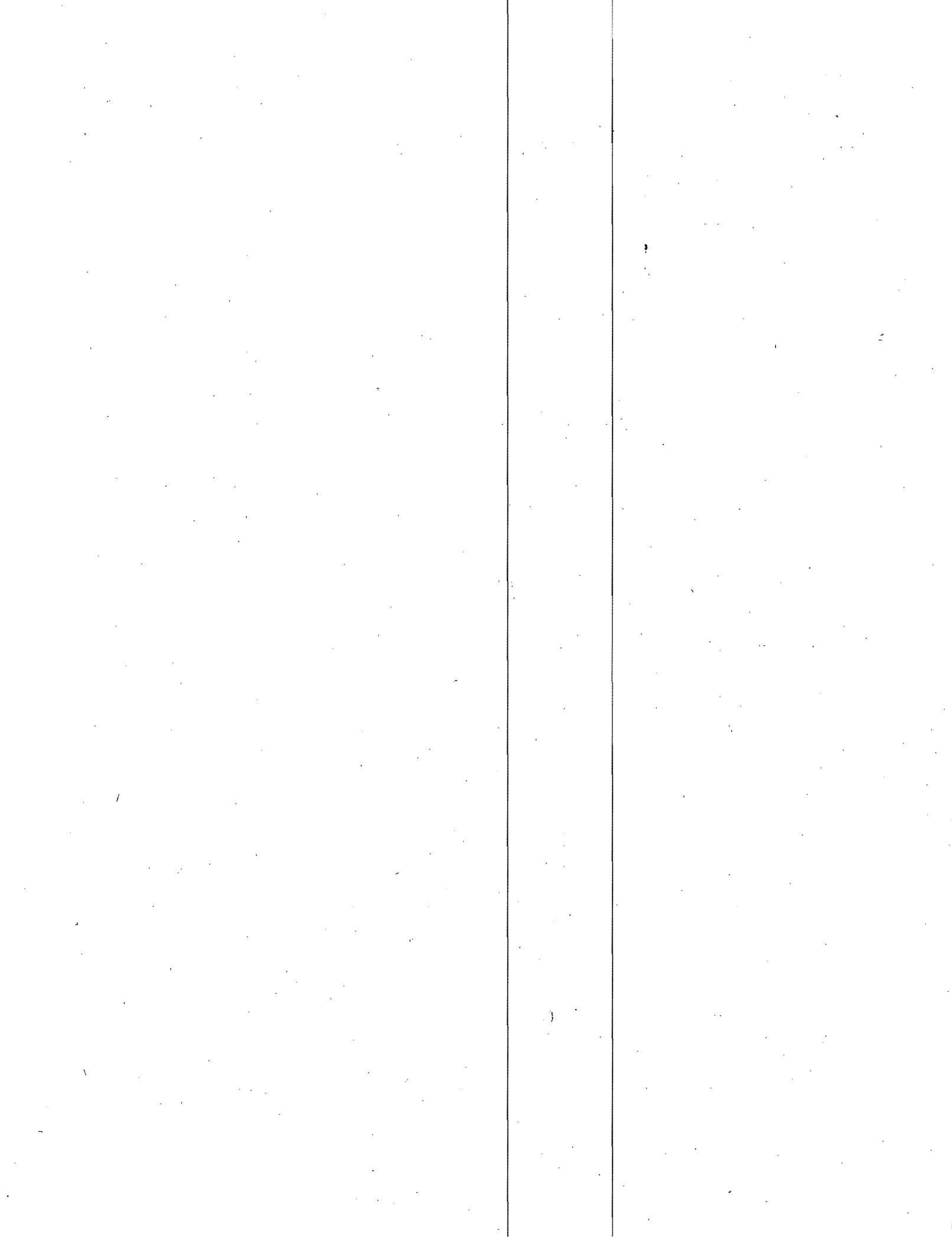
TOC: Top of well casing
 PSH: Phase separated hydrocarbons
 ND: Not detected in well
 NG: Well not gauged
 Source: W. Connolly & T. Campbell (IT Corp.) / J. Rhodes (Williams) (9/27 & 28/99)

LABORATORY DATA NOTES

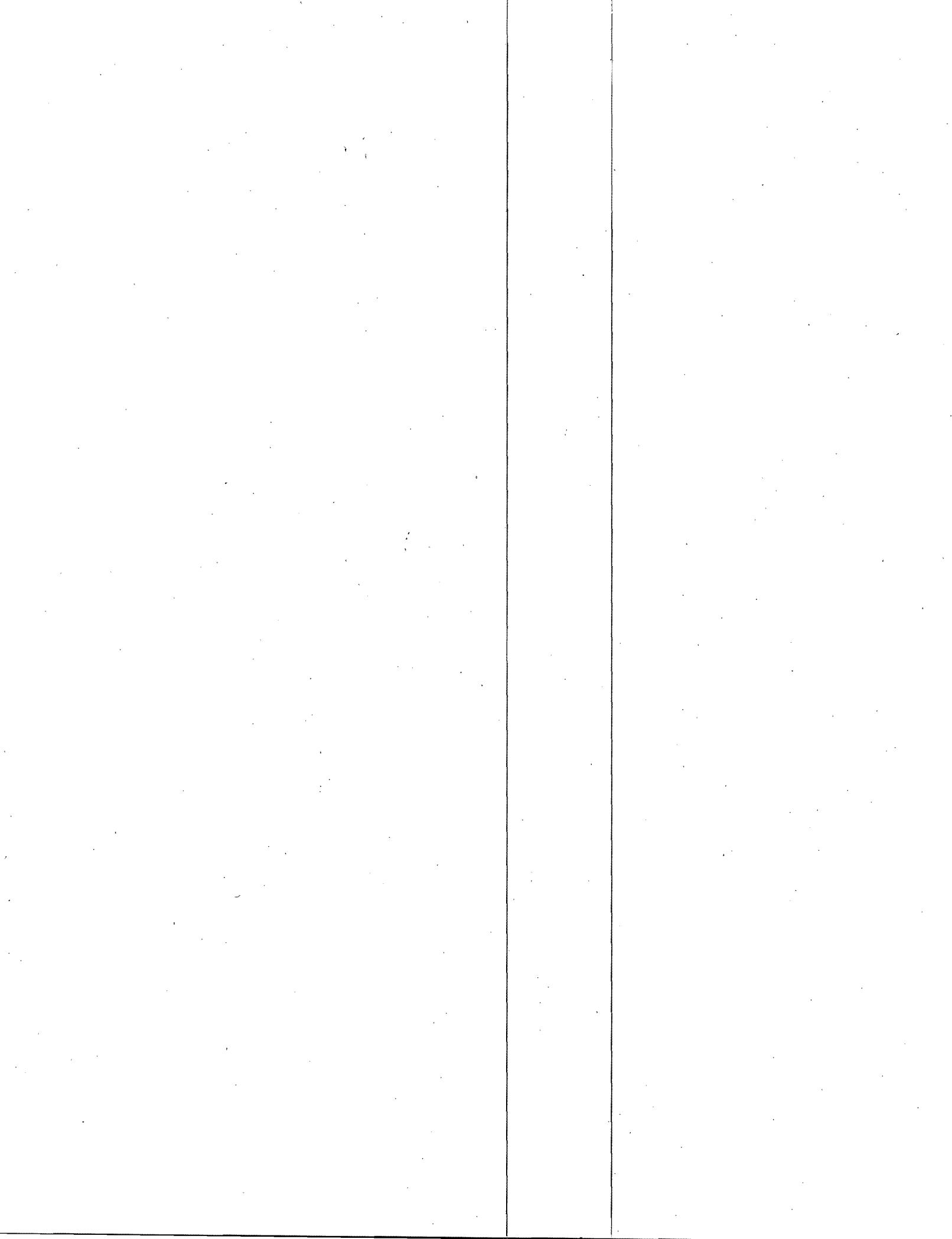
GRO: Gasoline range hydrocarbons by Tennessee Method
 EPH: Extractable petroleum hydrocarbons by Tennessee Method
 TPH: Total petroleum hydrocarbons
 TOTAL TPH: Sum total of GRO concentration and EPH concentration
 NS: Well not sampled
 NA: Sample not analyzed for constituent
 ND: Constituent not detected in sample
 Source: Specialized Assays, Inc., Nashville, TN (10/99)

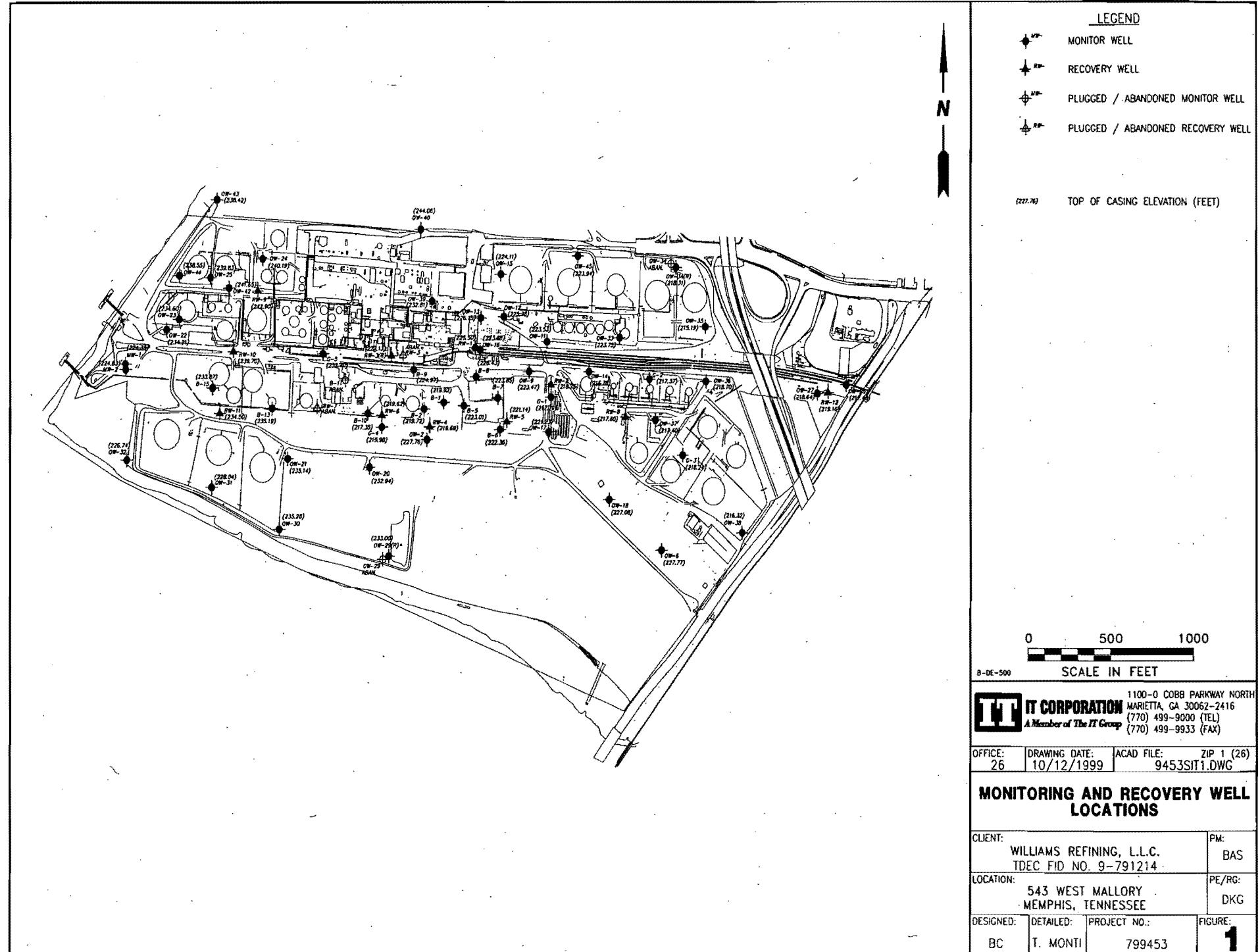


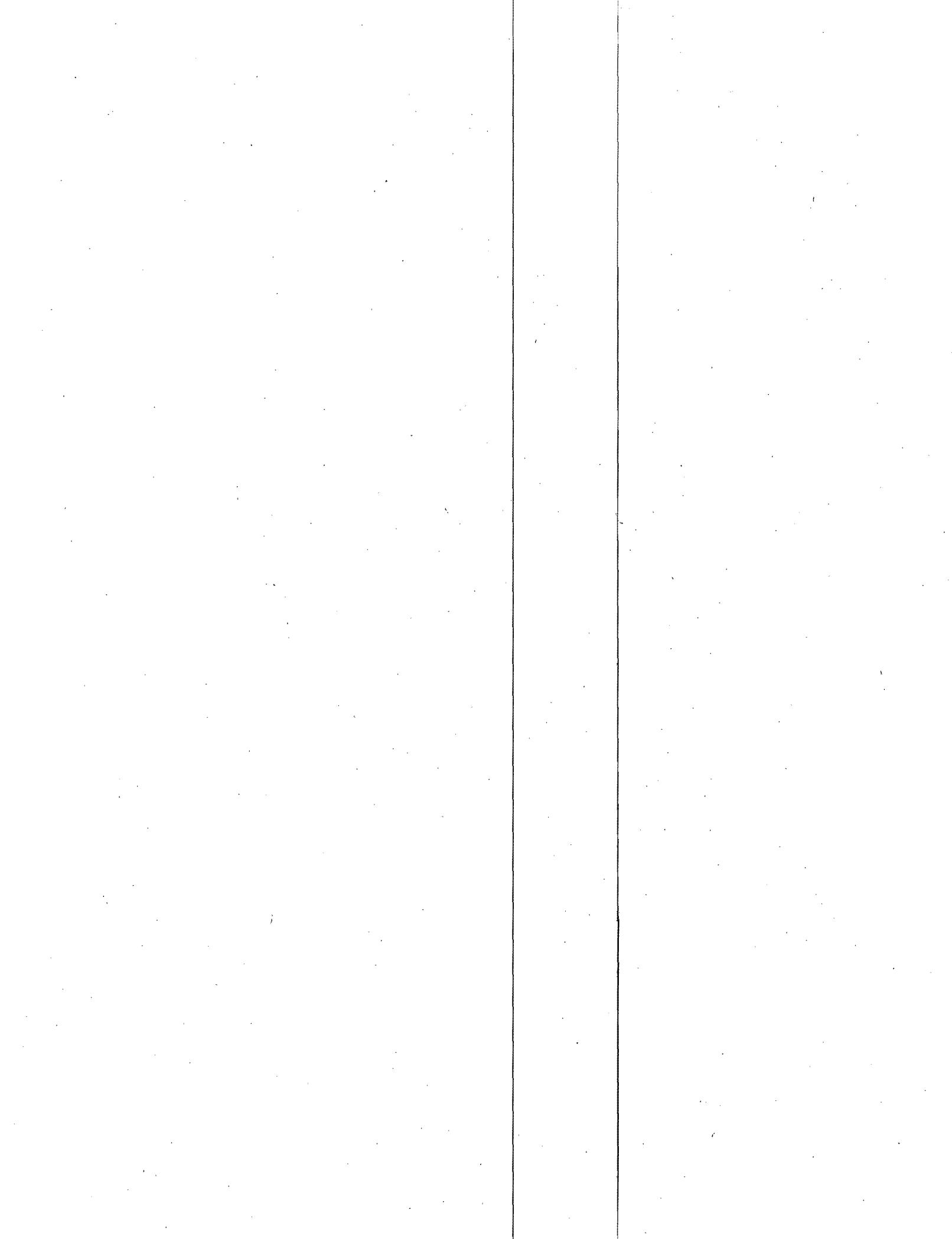
FIGURES



FIGURES

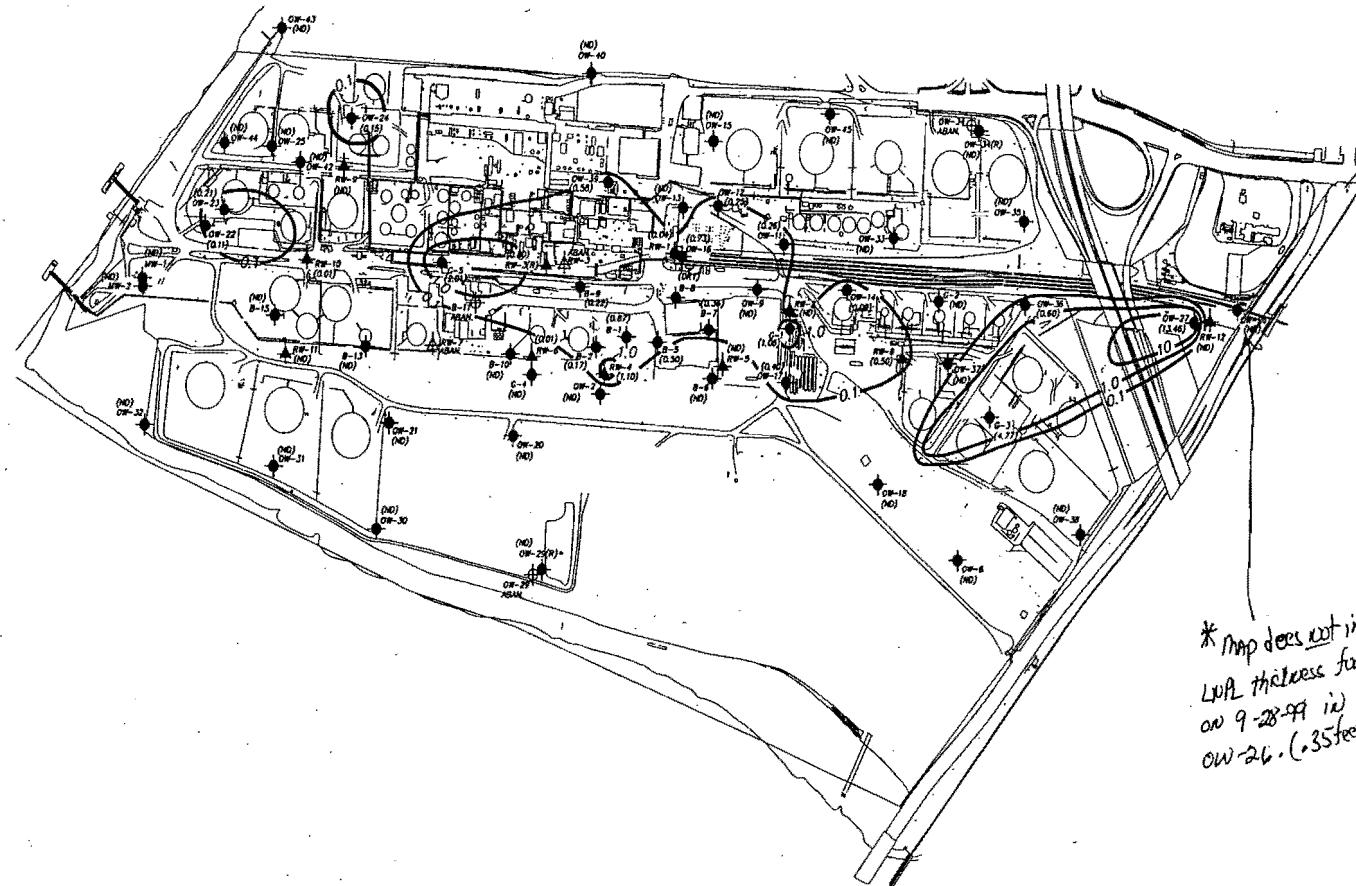






LEGEND

- ◆ MONITOR WELL
- ◆ RECOVERY WELL
- ◆ PLUGGED / ABANDONED MONITOR WELL
- ◆ PLUGGED / ABANDONED RECOVERY WELL



PRODUCT THICKNESS CONTOUR

(D.60) APPARENT PRODUCT THICKNESS (IN FEET)

NS WELL NOT SAMPLED

NG WELL NOT GAUGED

ND NOT DETECTED

NA NOT AVAILABLE

0 500 1000
SCALE IN FEET

B-DE-500



1100-D COBB PARKWAY NORTH
MARIETTA, GA 30062-2416
(770) 499-9000 (TEL)
(770) 499-9933 (FAX)

OFFICE: 26 DRAWING DATE: 11/10/1999 ACAD FILE: ZIP 1 (26)
9453SIT1.DWG

APPARENT LNAPL THICKNESS CONTOURS

SAMPLE DATE: 09/27/1999

CONTOUR INTERVAL: VARIED

CLIENT: WILLIAMS REFINING, L.L.C.
TDEC FID NO. 9-791214

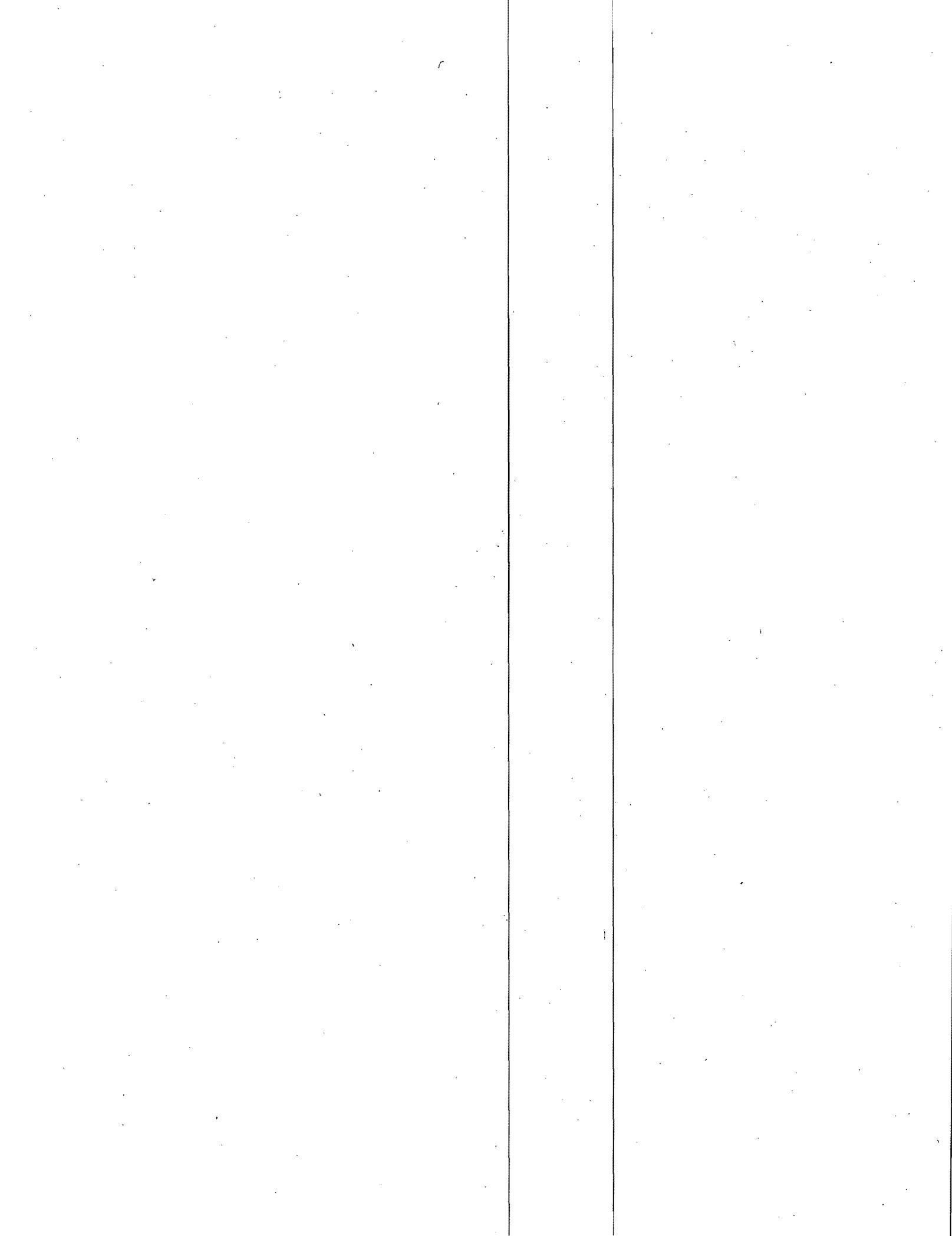
PM:
BAS

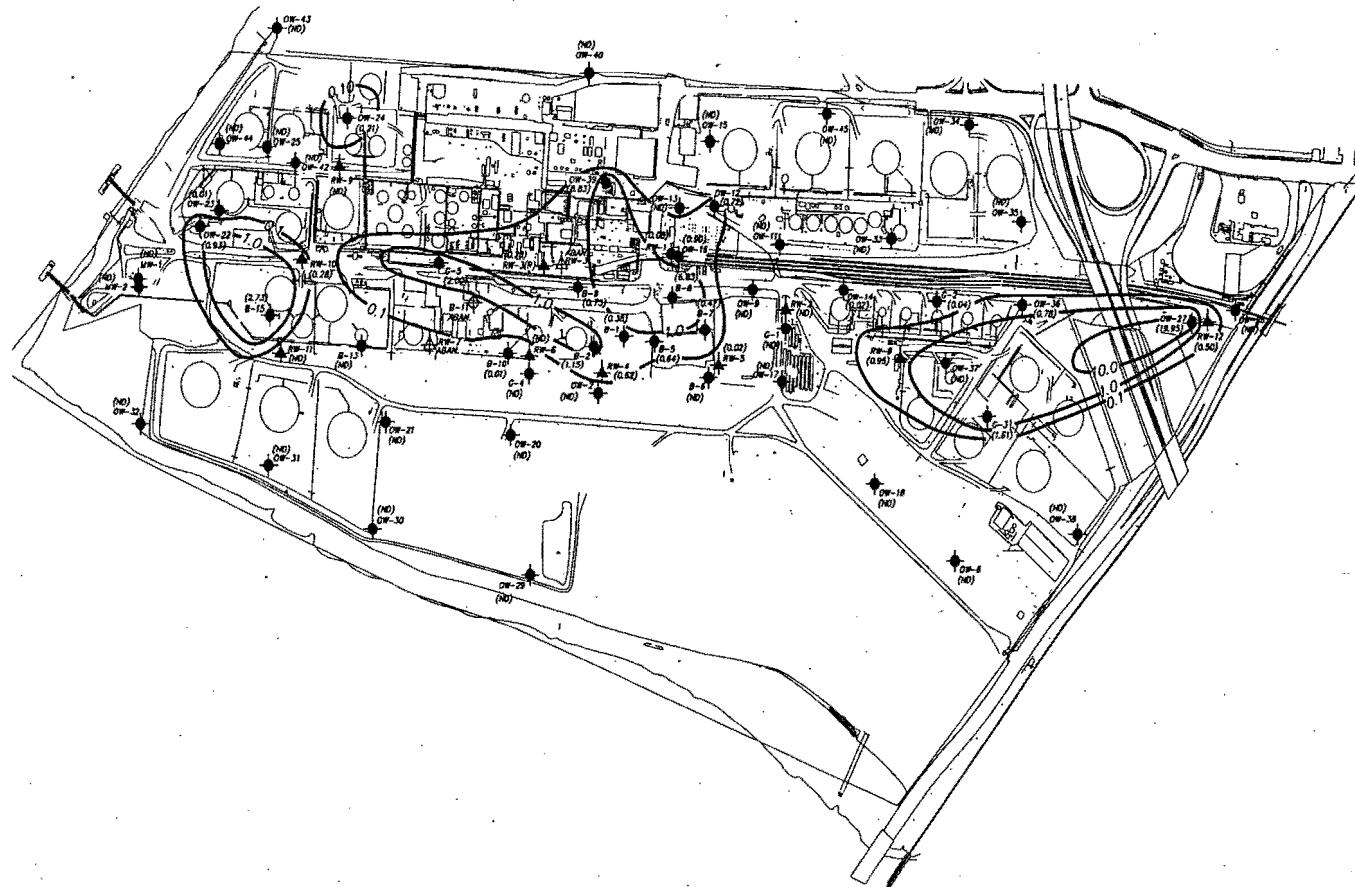
LOCATION: 543 WEST MALLORY
MEMPHIS, TENNESSEE

PE/RG:
DKG

DESIGNED: BC DETAILED: T. MONTI PROJECT NO.: 799453

FIGURE:
2





LEGEND

-  MONITOR WELL
 -  RECOVERY WELL
 -  PLUGGED / ABANDONED MONITOR WELL
 -  PLUGGED / ABANDONED RECOVERY WELL

PRODUCT THICKNESS CONTOUR

(0.62) APPARENT PRODUCT THICKNESS
(IN FEET)

ND NOT DETECTED

OFFICE: DRAWING DATE: ACAD FILE: ZIP 1 (26)
26 11/10/1999 9453SIT-A.DWG

APPARENT LNAPL THICKNESS CONTOURS

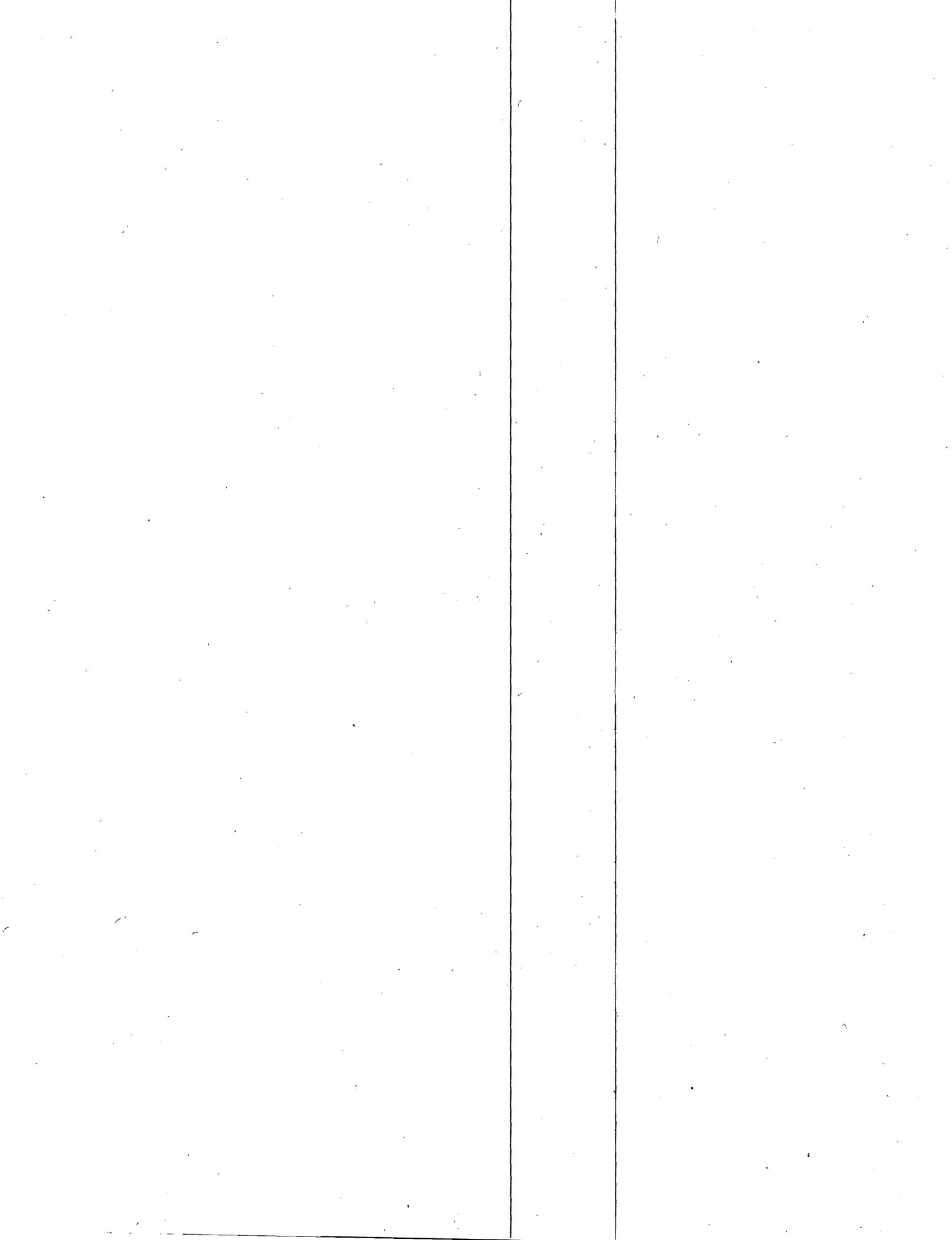
SAMPLE DATE: 6/30/1999
CONTOUR INTERVAL: VARIED

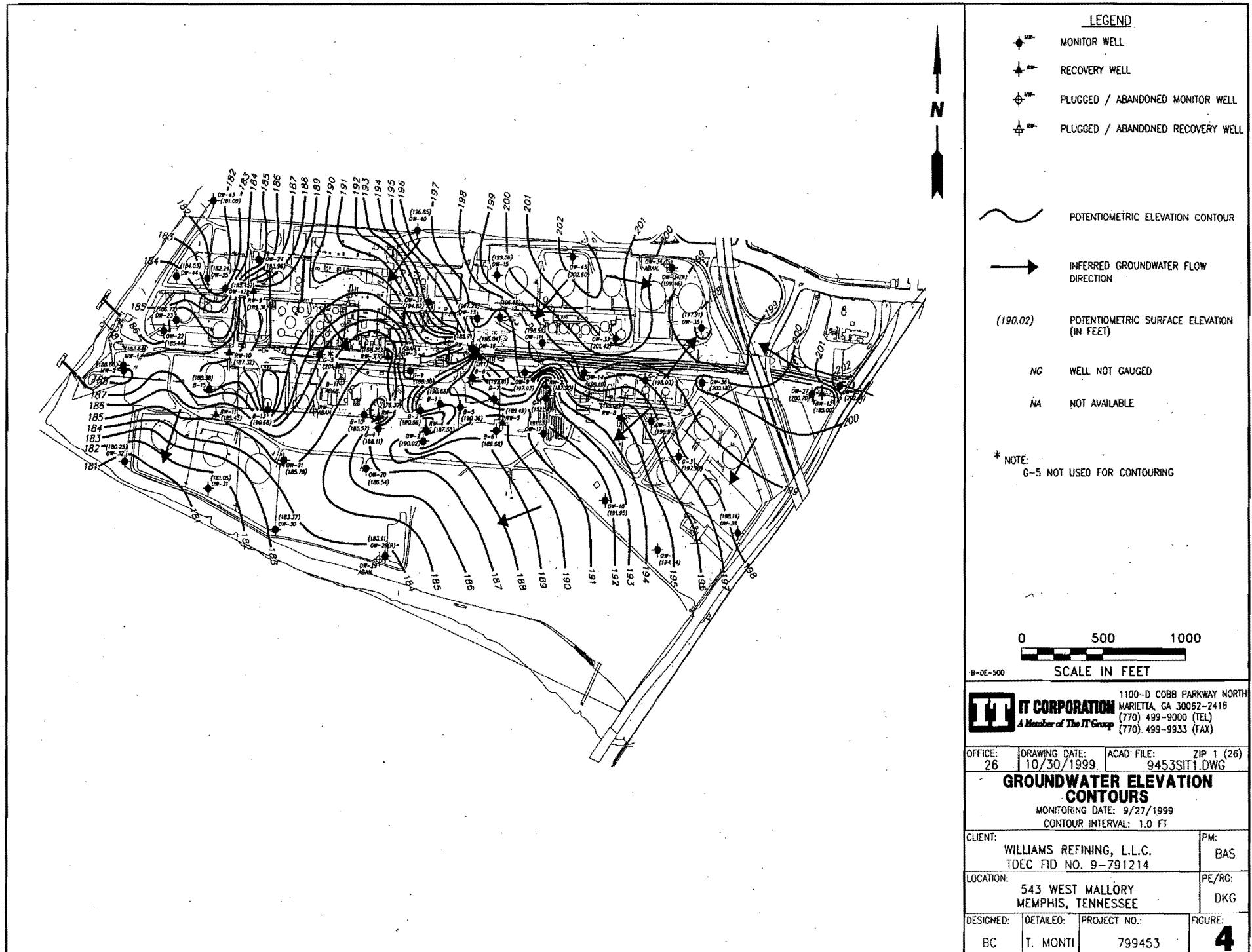
CLIENT: WILLIAMS REFINING, L.L.C.
TDEC FID NO. 9-791214

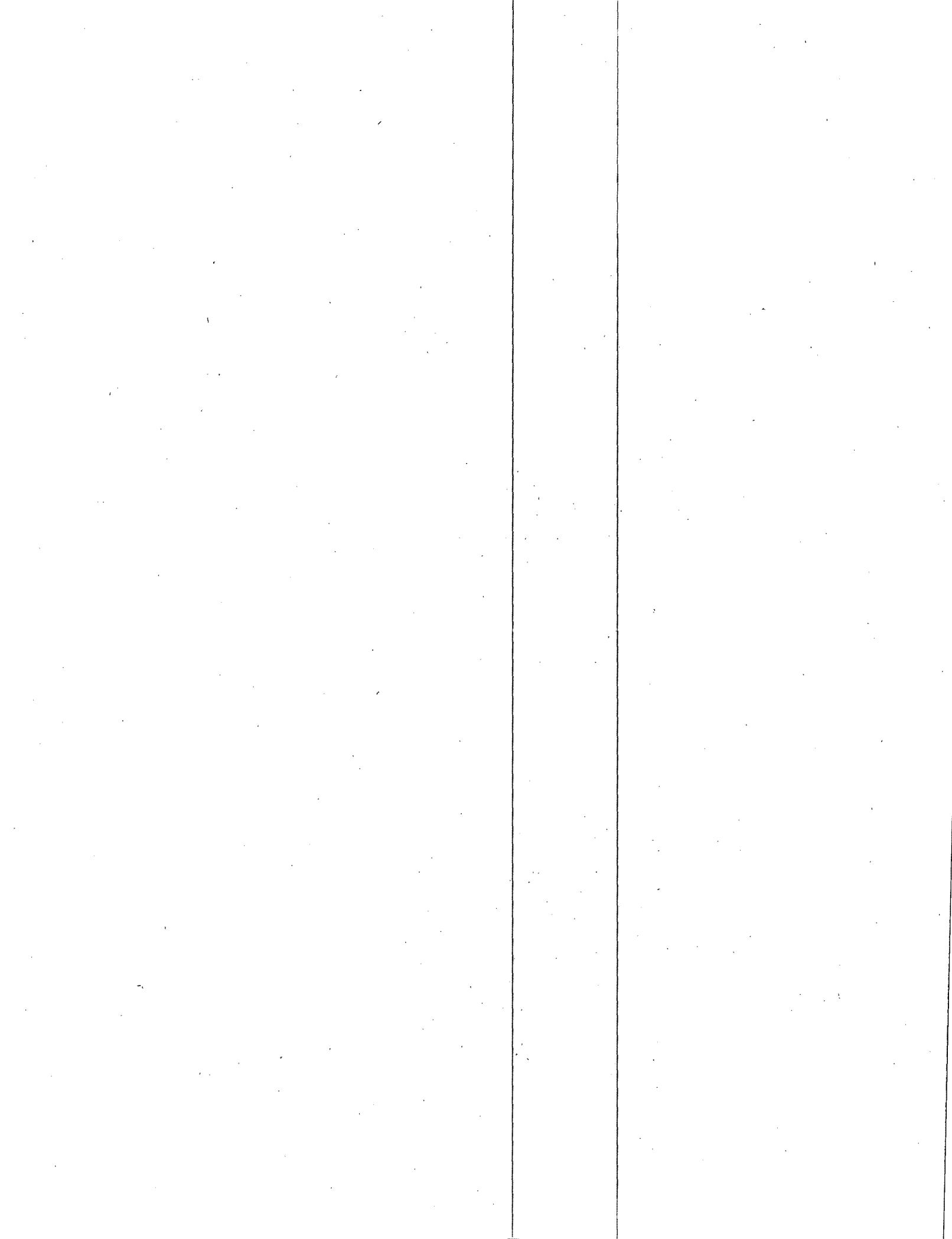
LOCATION: 543 WEST MALLORY
MEMPHIS, TENNESSEE

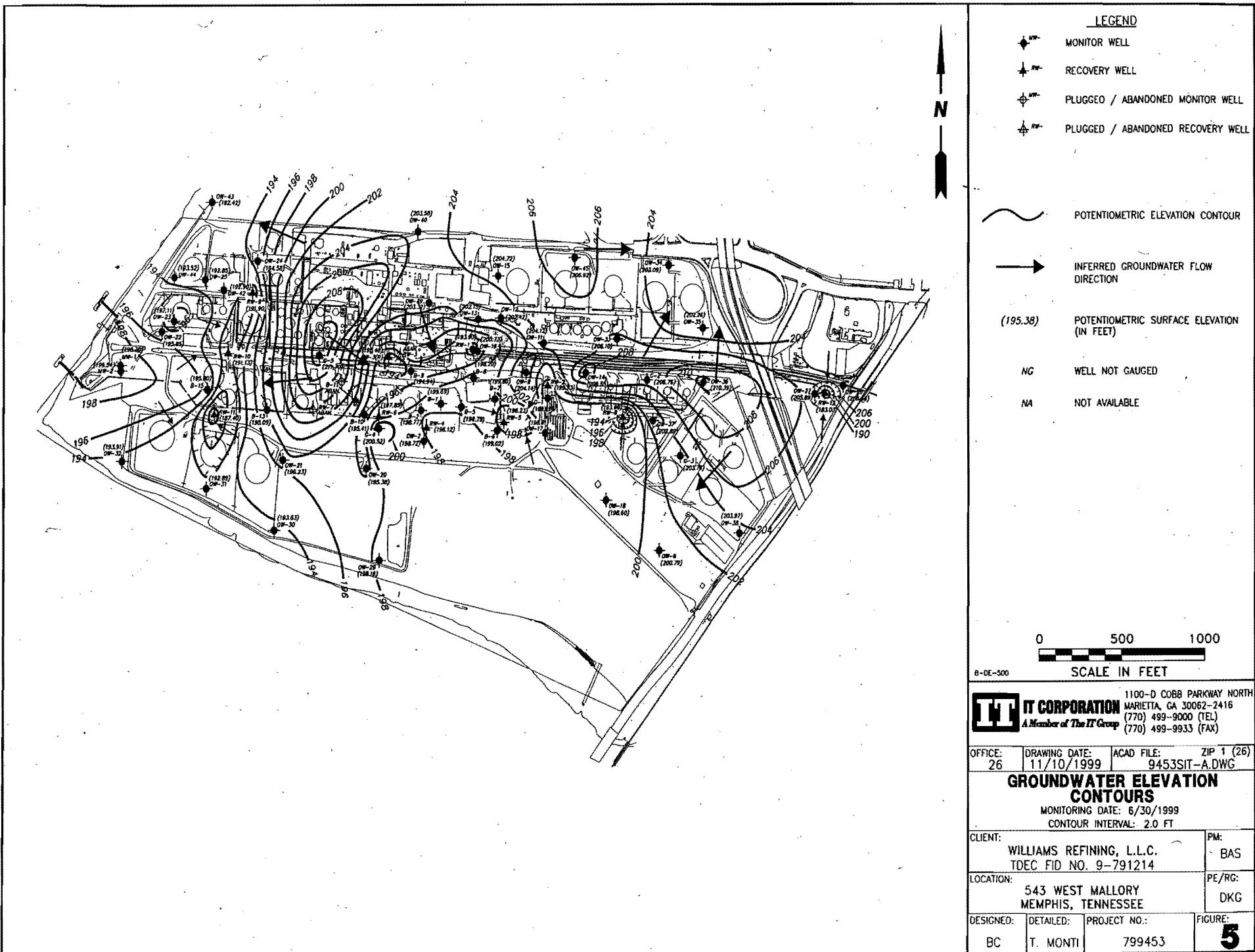
MEMPHIS, TENNESSEE

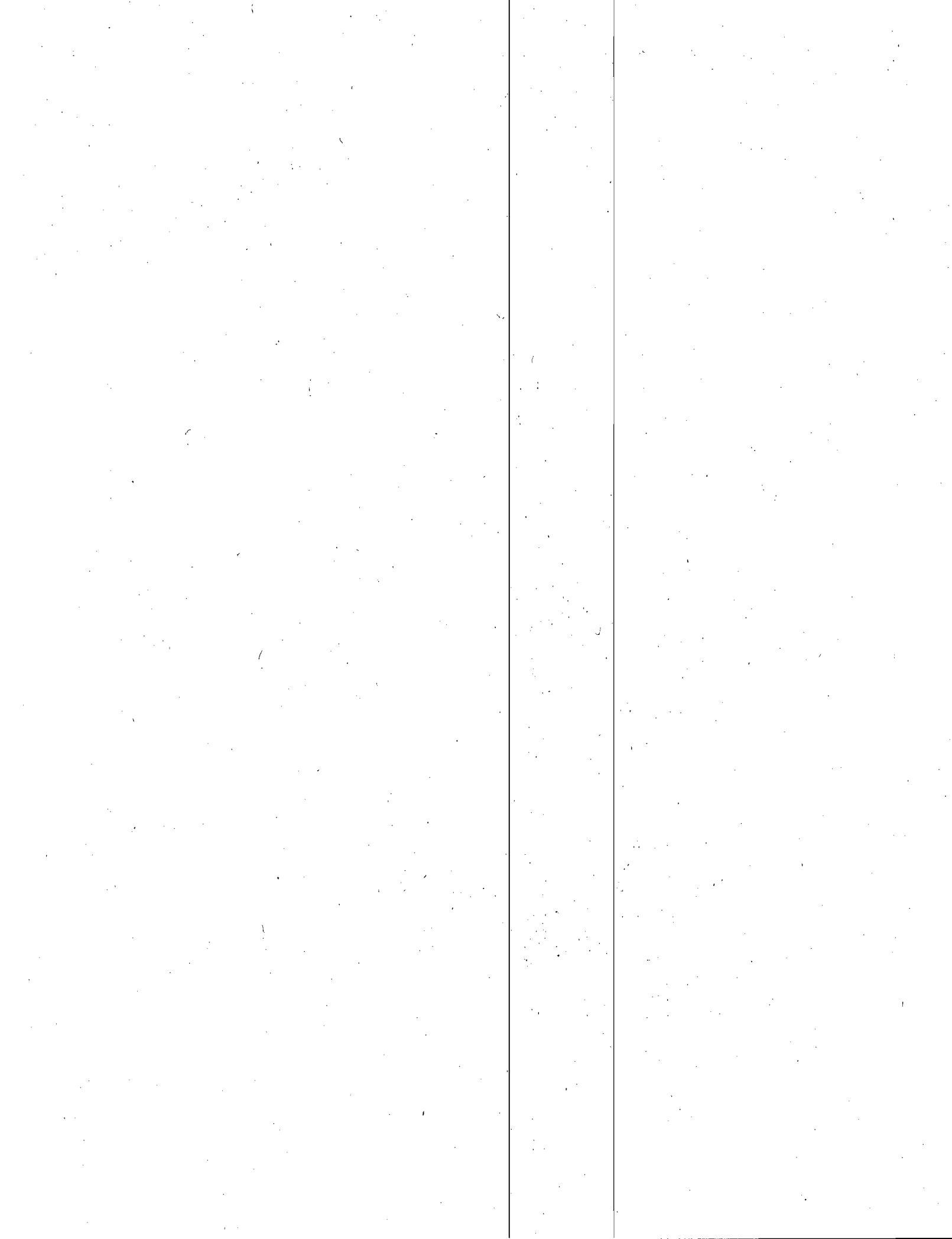
FIGURE:











LEGEND

- ◆ MONITOR WELL
- ◆ RECOVERY WELL
- ◆ PLUGGED / ABANDONED MONITOR WELL
- ◆ PLUGGED / ABANDONED RECOVERY WELL

(0.0030) CONSTITUENT CONCENTRATION IN PPM
(ND) NOT DETECTED
(NS) WELL NOT SAMPLED

NOTE:
STATEWIDE CONSTITUENT CLEANUP
CONCENTRATION = 0.07 PPM

0 500 1000


B-DE-500 SCALE IN FEET



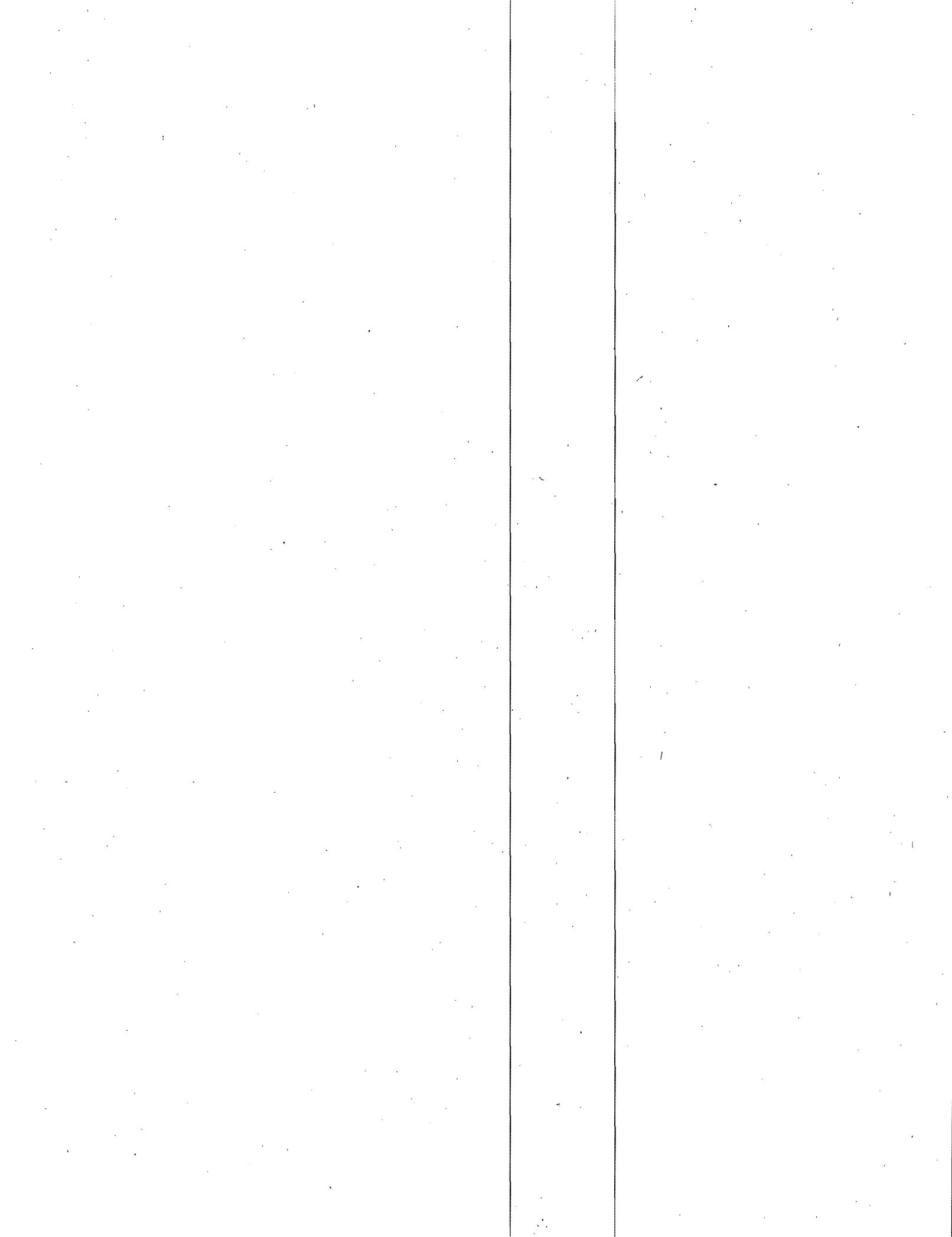
1100-D COBB PARKWAY NORTH
MARIETTA, GA 30062-2416
(770) 499-9000 (TEL)
(770) 499-9933 (FAX)

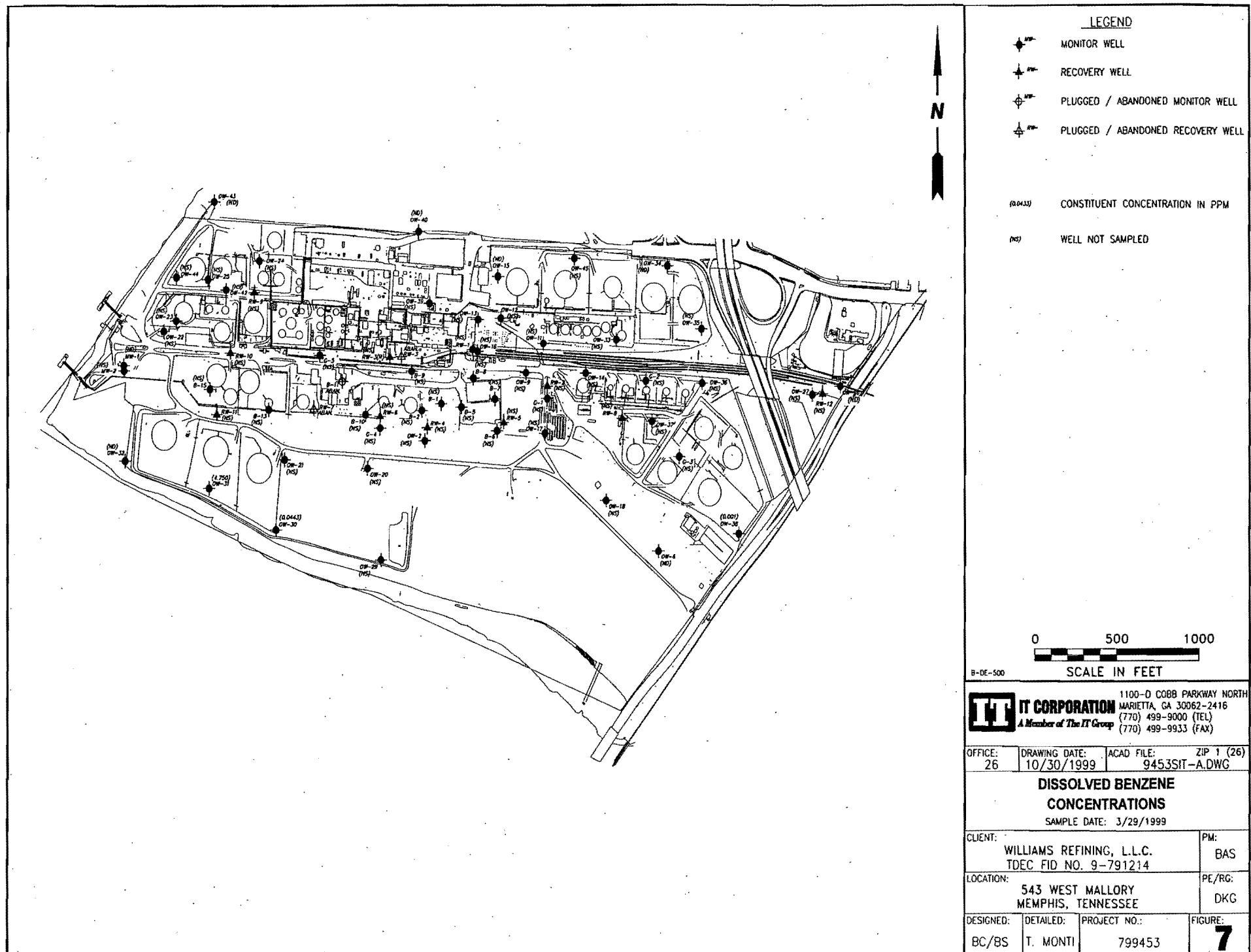
OFFICE: 26 DRAWING DATE: 10/29/1999 ACAD FILE: ZIP 1 (26)
9453SIT1.DWG

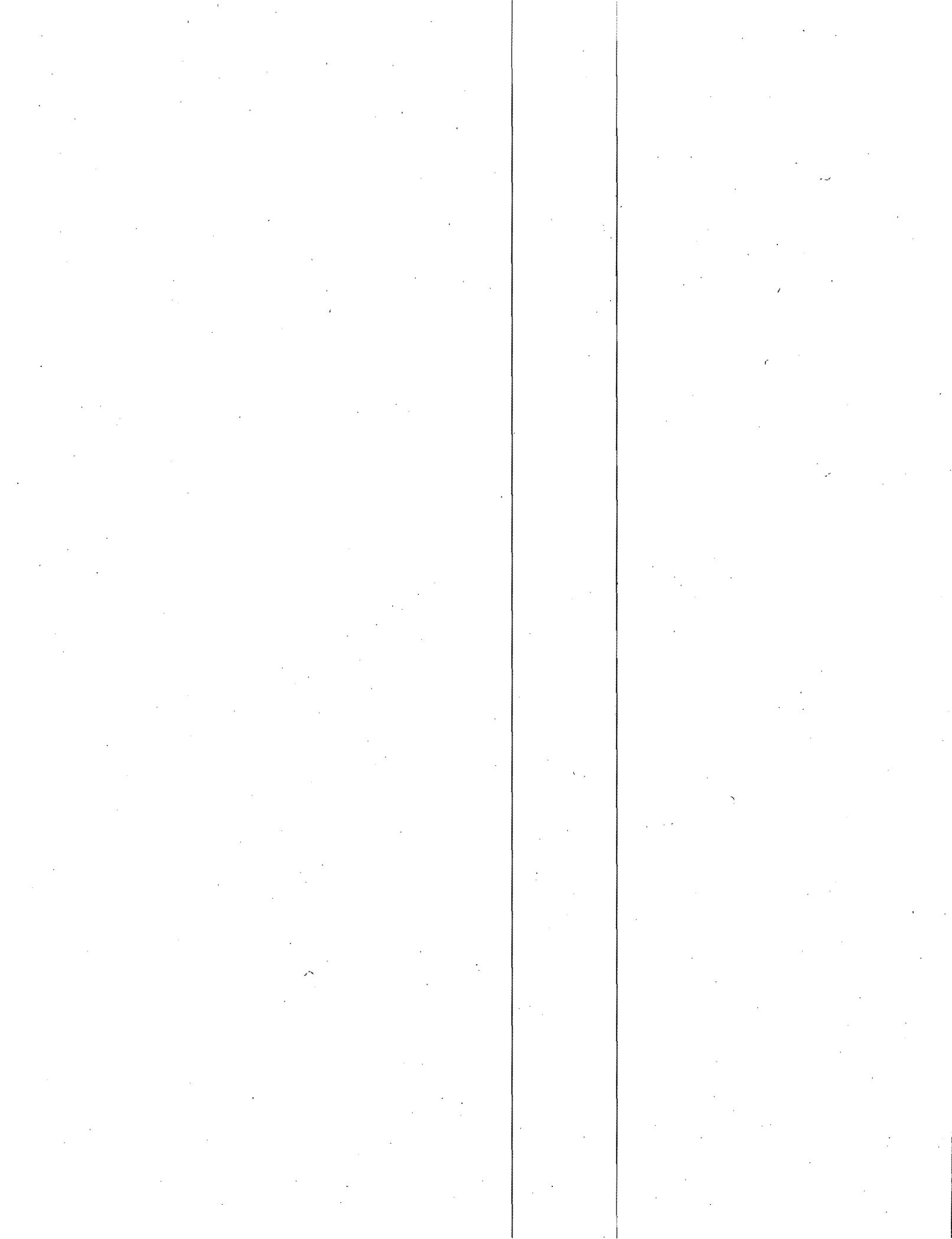
**DISSOLVED BENZENE
CONCENTRATIONS**

SAMPLE DATE: 9/28/1999

CLIENT:	WILLIAMS REFINING, L.L.C. TDEC FID NO. 9-791214	PM: BAS
LOCATION:	543 WEST MALLORY MEMPHIS, TENNESSEE	PE/RG: DKG
DESIGNED:	DETAILED: BS T. MONTI	PROJECT NO.: 799453 FIGURE: 6







LEGEND

- ◆ MONITOR WELL
- ▲ RECOVERY WELL
- ◇ PLUGGED / ABANDONED MONITOR WELL
- △ PLUGGED / ABANDONED RECOVERY WELL

(2.59) CONSTITUENT CONCENTRATION IN PPM

(ND) NOT DETECTED

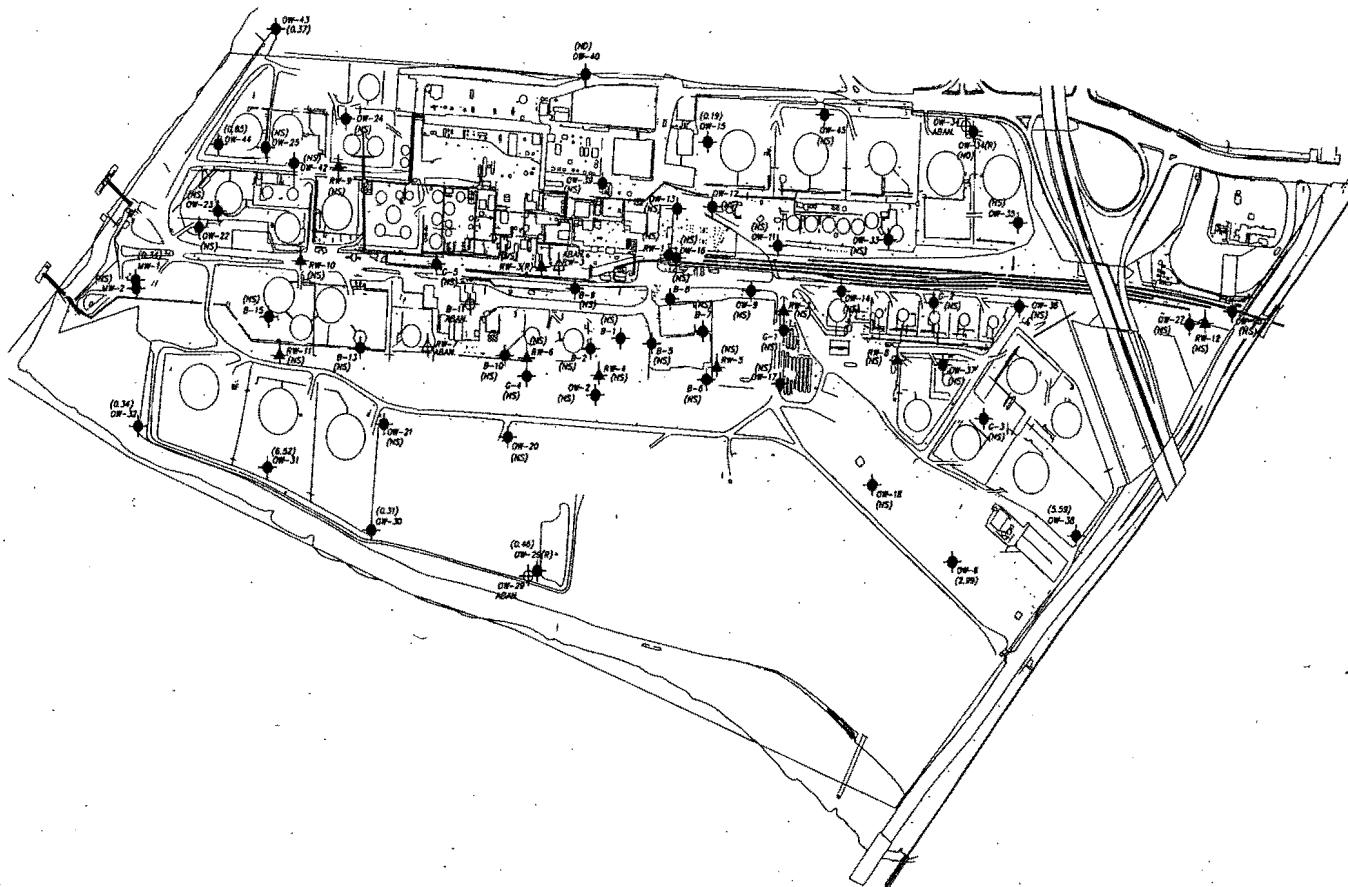
(NS) WELL NOT SAMPLED

 INFERRED EXTENT OF CONSTITUENT CONCENTRATION EXCEEDING STANDARD

NOTE:
STATEWIDE CONSTITUENT CLEANUP
CONCENTRATION = 1 PPM

0 500 1000

SCALE IN FEET



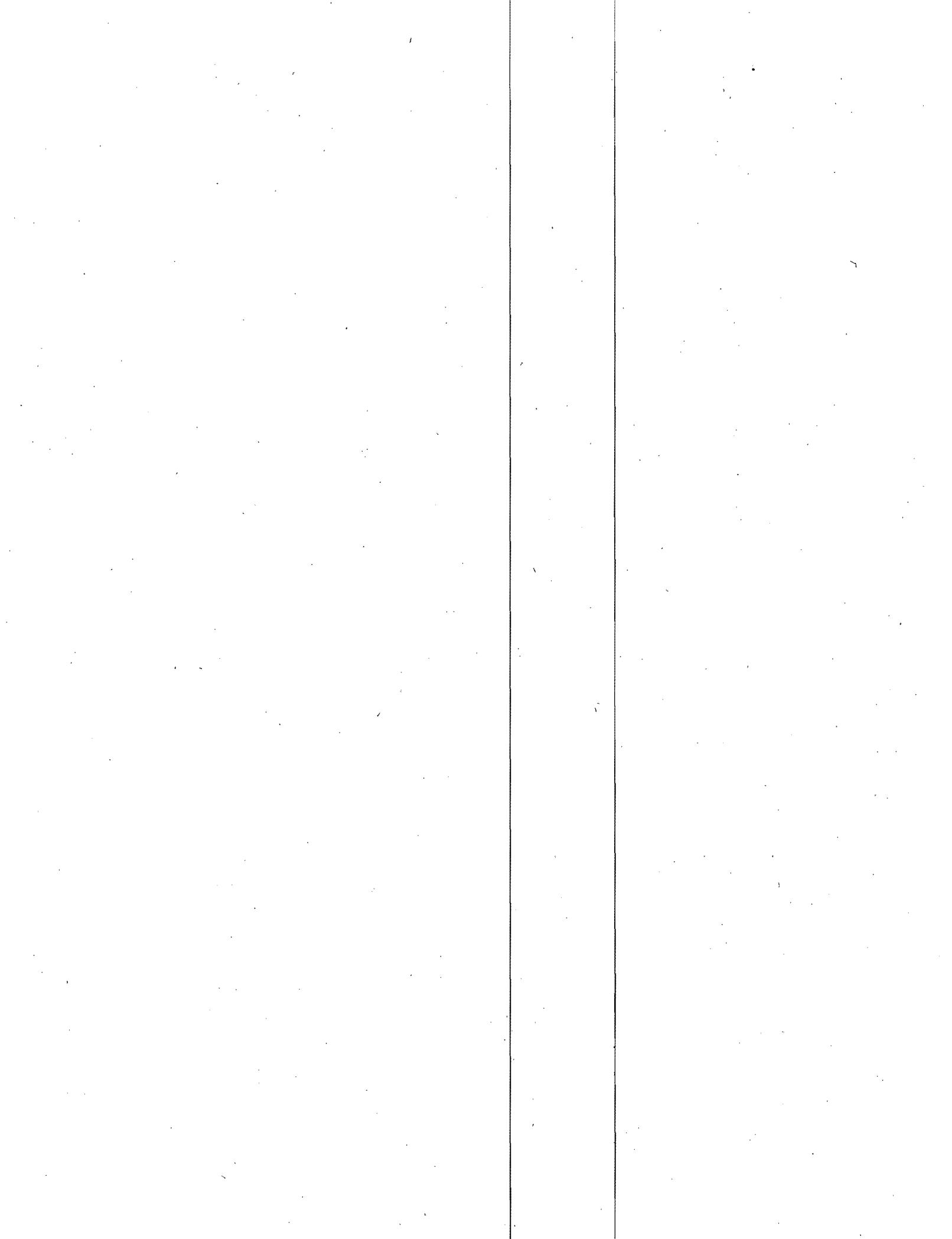
IT IT CORPORATION 1100-D COBB PARKWAY NORTH
A Member of The IT Group HARRIETTA, GA 30062-2416
(770) 499-9000 (TEL)
(770) 499-9933 (FAX)

OFFICE: 26 DRAWING DATE: 10/29/1999 ACAD FILE: ZIP 1 (26)
9453SIT1.DWG

DISSOLVED TPH CONCENTRATIONS

SAMPLE DATE: 10/14/1999

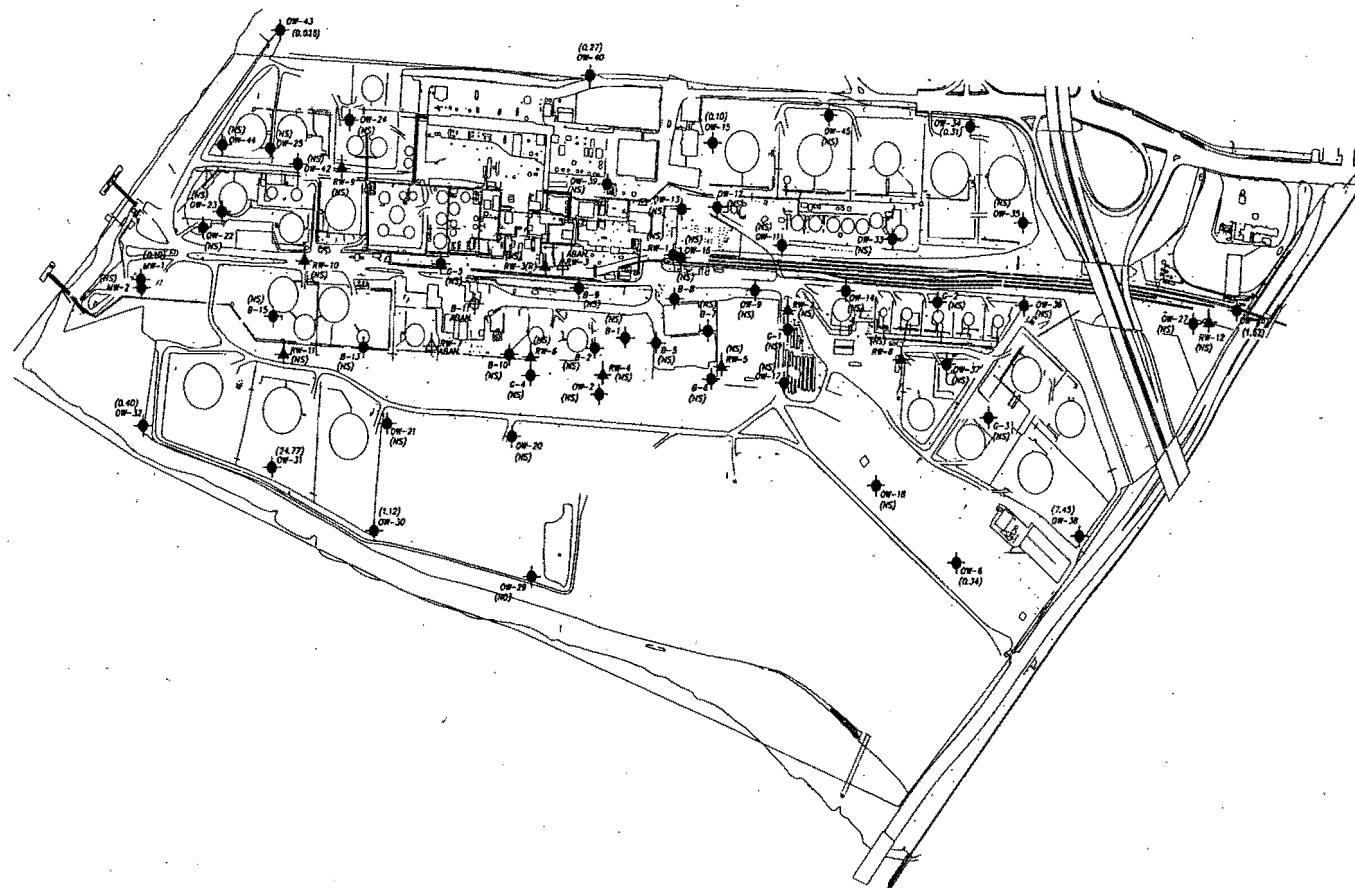
CLIENT:	WILLIAMS REFINING, L.L.C. TDEC FID NO. 9-791214	PM:	BAS
LOCATION:	543 WEST MALLORY MEMPHIS, TENNESSEE	PE/RG:	DKG
DESIGNED:	DETAILED:	PROJECT NO.:	FIGURE:
BS	T. MONTI	799453	8



LEGEND

- ◆ MONITOR WELL
- ◆ RECOVERY WELL
- ◆ PLUGGED / ABANDONED MONITOR WELL
- ◆ PLUGGED / ABANDONED RECOVERY WELL

- (0.34) CONSTITUENT CONCENTRATION IN PPM
- (NG) WELL NOT GAUGED
- (NS) WELL NOT SAMPLED
- (NA) SAMPLE NOT ANALYZED FOR CONSTITUENT



0 500 1000
SCALE IN FEET

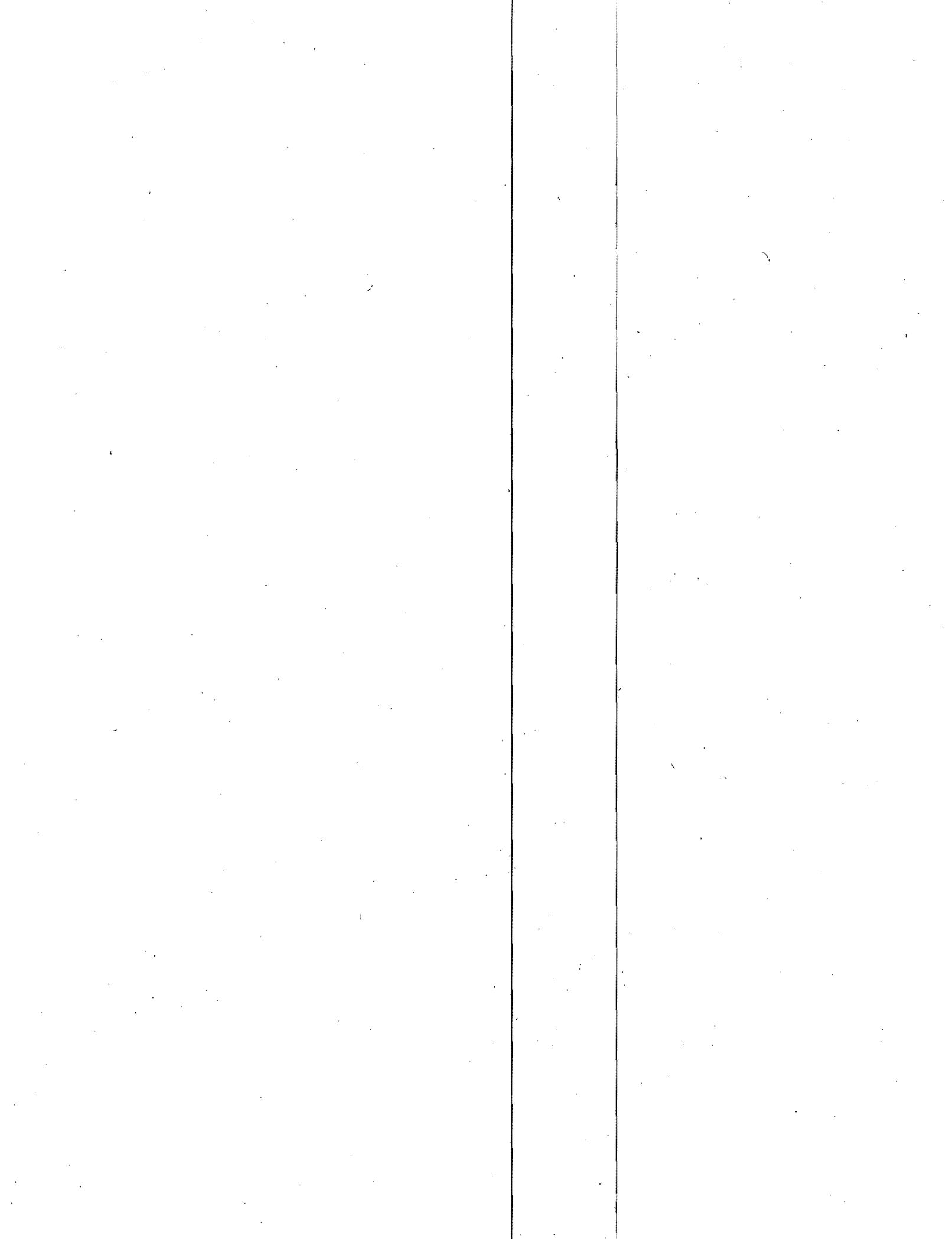
B-DE-500
IT CORPORATION 1100-D COBB PARKWAY NORTH
A Member of The IT Group MARIETTA, GA 30062-2416
(770) 499-9000 (TEL)
(770) 499-9933 (FAX)

OFFICE: 26 DRAWING DATE: 10/30/1999 ACAD FILE: ZIP 1 (26)
94453SIT-A.DWG

DISSOLVED TPH CONCENTRATIONS

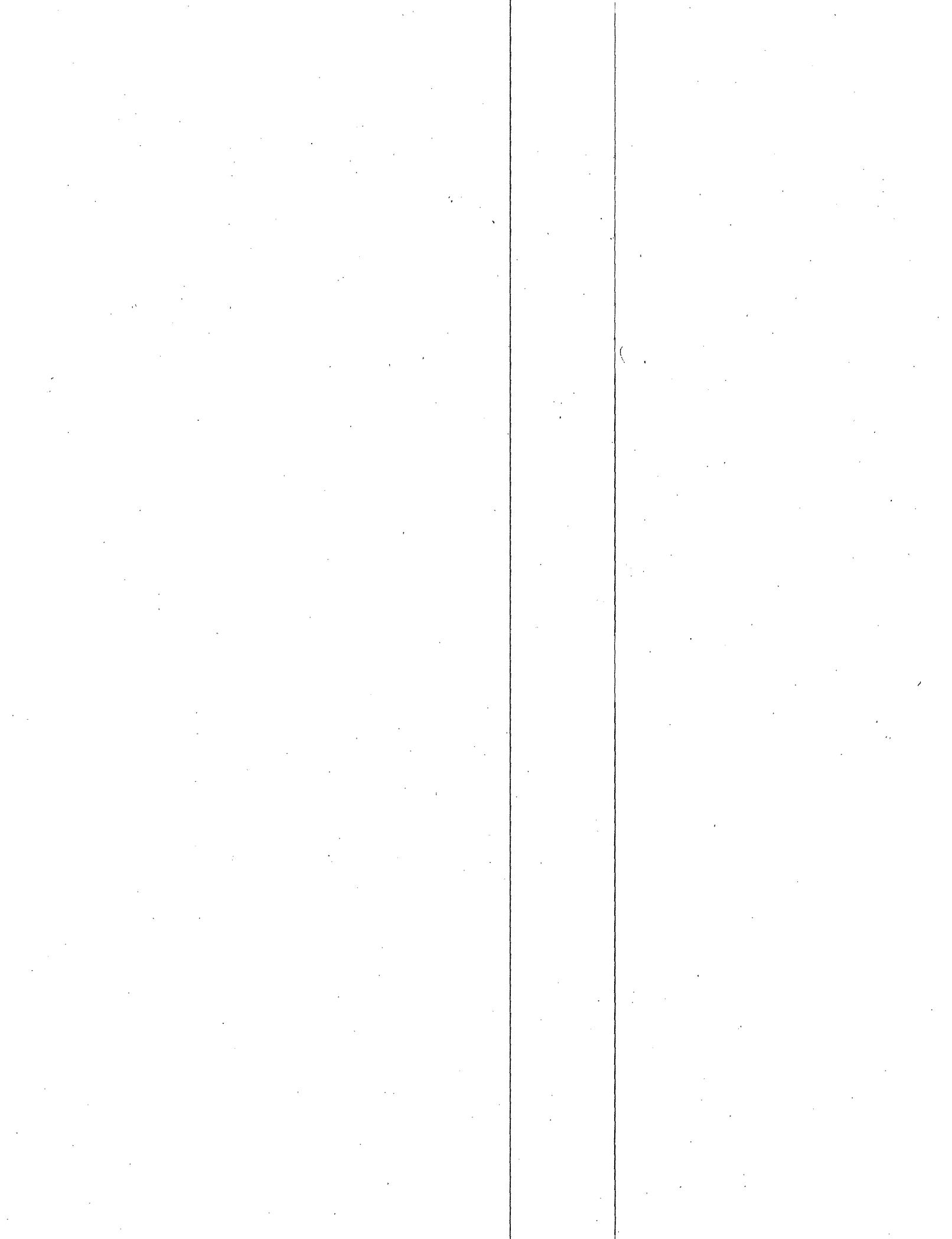
SAMPLE DATE: 3/29/1999

CLIENT:	WILLIAMS REFINING, L.L.C. TDEC FID NO. 9-791214		PM: BAS
LOCATION:	543 WEST MALLORY MEMPHIS, TENNESSEE		PE/RG: DKG
DESIGNED:	DETAILED:	PROJECT NO.:	FIGURE:
BC/BS	T. MONTI	799453	9



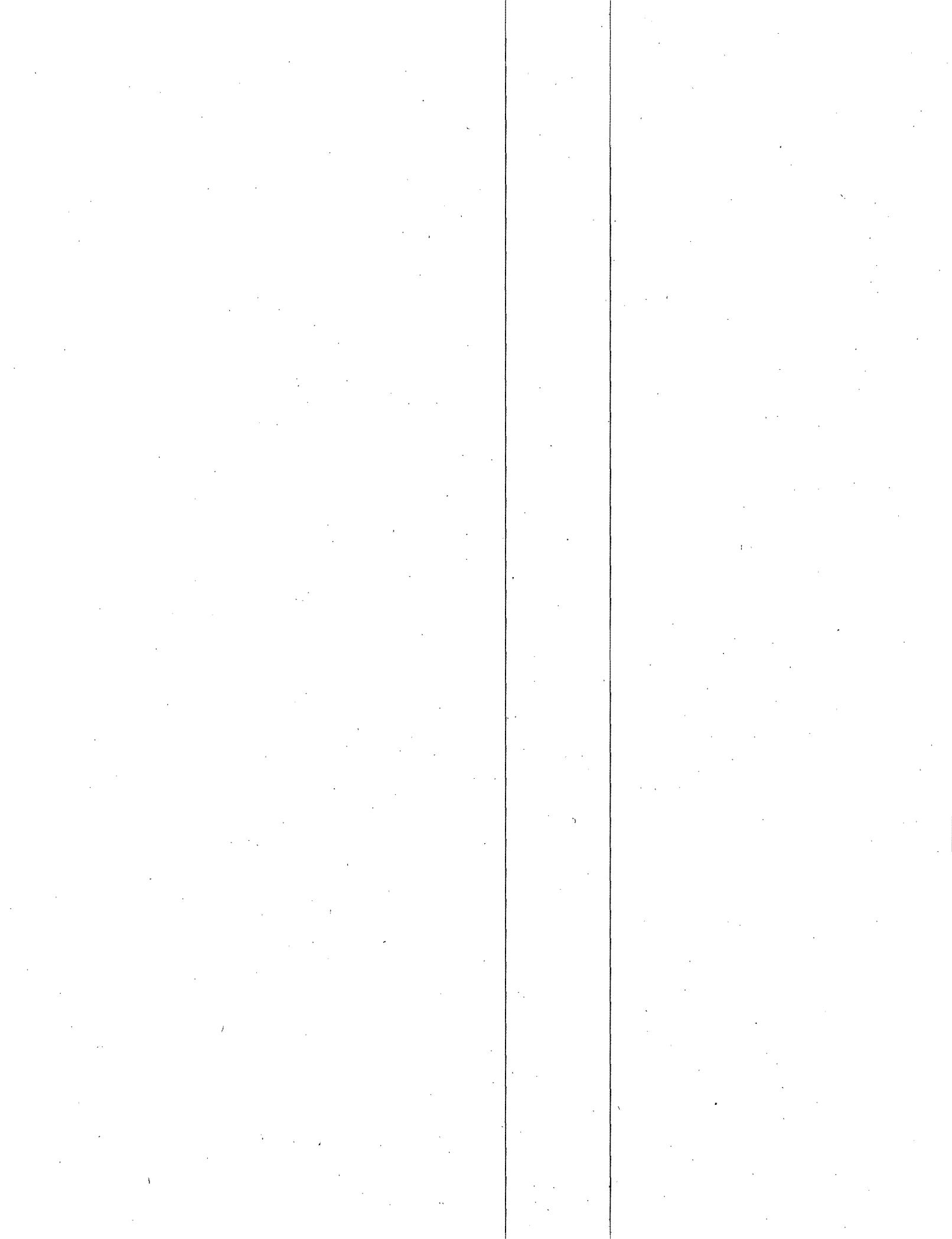
APPENDIX

A



APPENDIX A

CERTIFICATES OF ANALYSIS REMEDIATION SYSTEM EFFLUENT



Certificate of Analysis

Williams Refining, L.L.C.
Memphis, TN

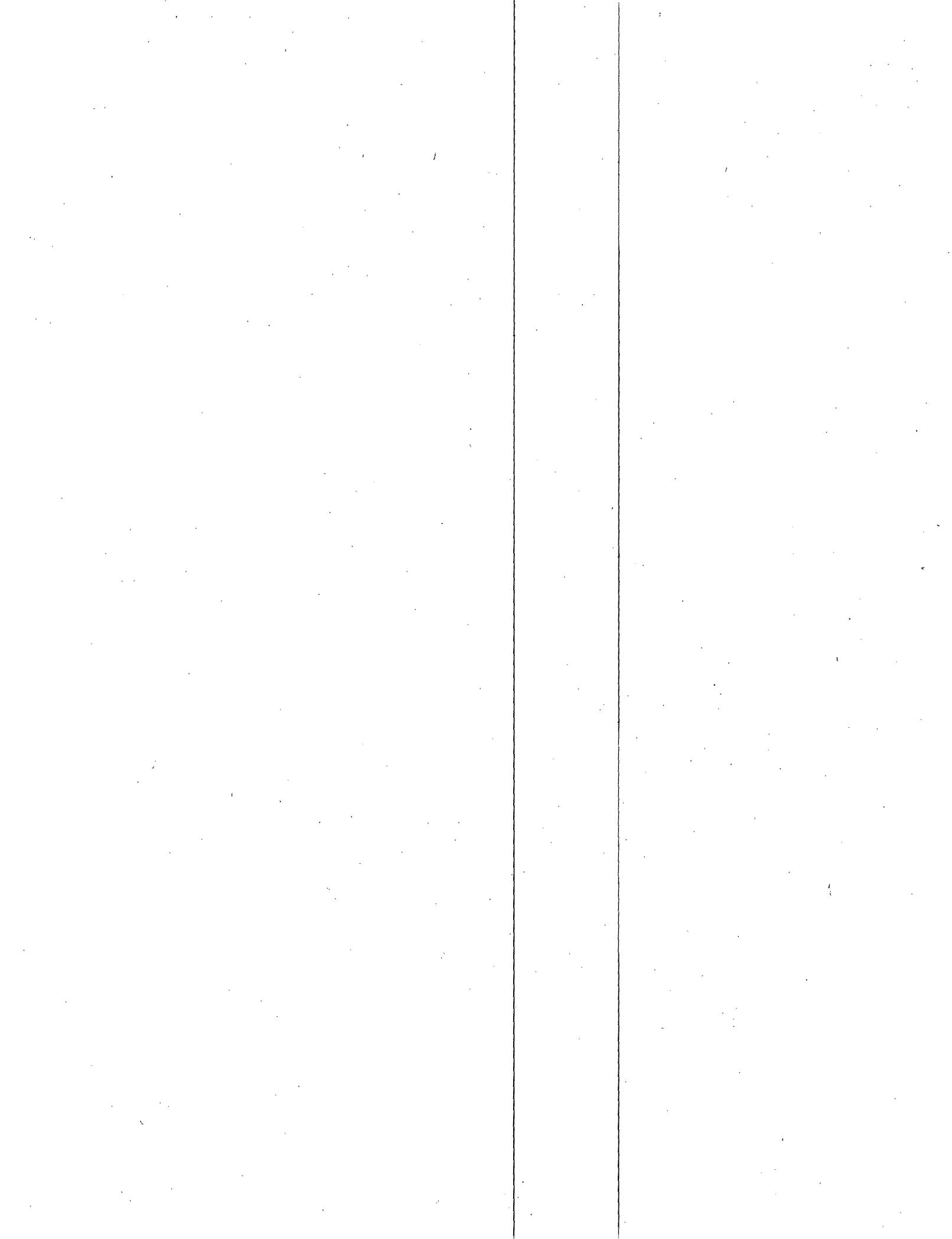
BTEX by Purge-and-Trap Gas Chromatography

Name of Sample: Recovery Well Combined Flow 1-11

Date of Sample	08-Apr-99	Analyte	Peak Area
Date of Analysis	23-Apr-99	Benzene	15,715,300
Analytical Run Number	022F2201.D	Toluene	11,486,000
Calibration Run Date	23-Apr-99	Ethylbenzene	1,240,870
Average Spike Recoveries, %		p,m - Xylenes	4,462,510
Benzene	93.6		
Toluene	93.3	o - Xylene	2,020,270
Ethylbenzene	94.9		
Total Xylenes	92.6	Chemist	Eric Branson

Concentration, mg/L

Benzene	18.81
Toluene	2.75
Ethylbenzene	1.90
Total Xylenes	8.92



Certificate of Analysis

Williams Refining, L.L.C.
Memphis, TN

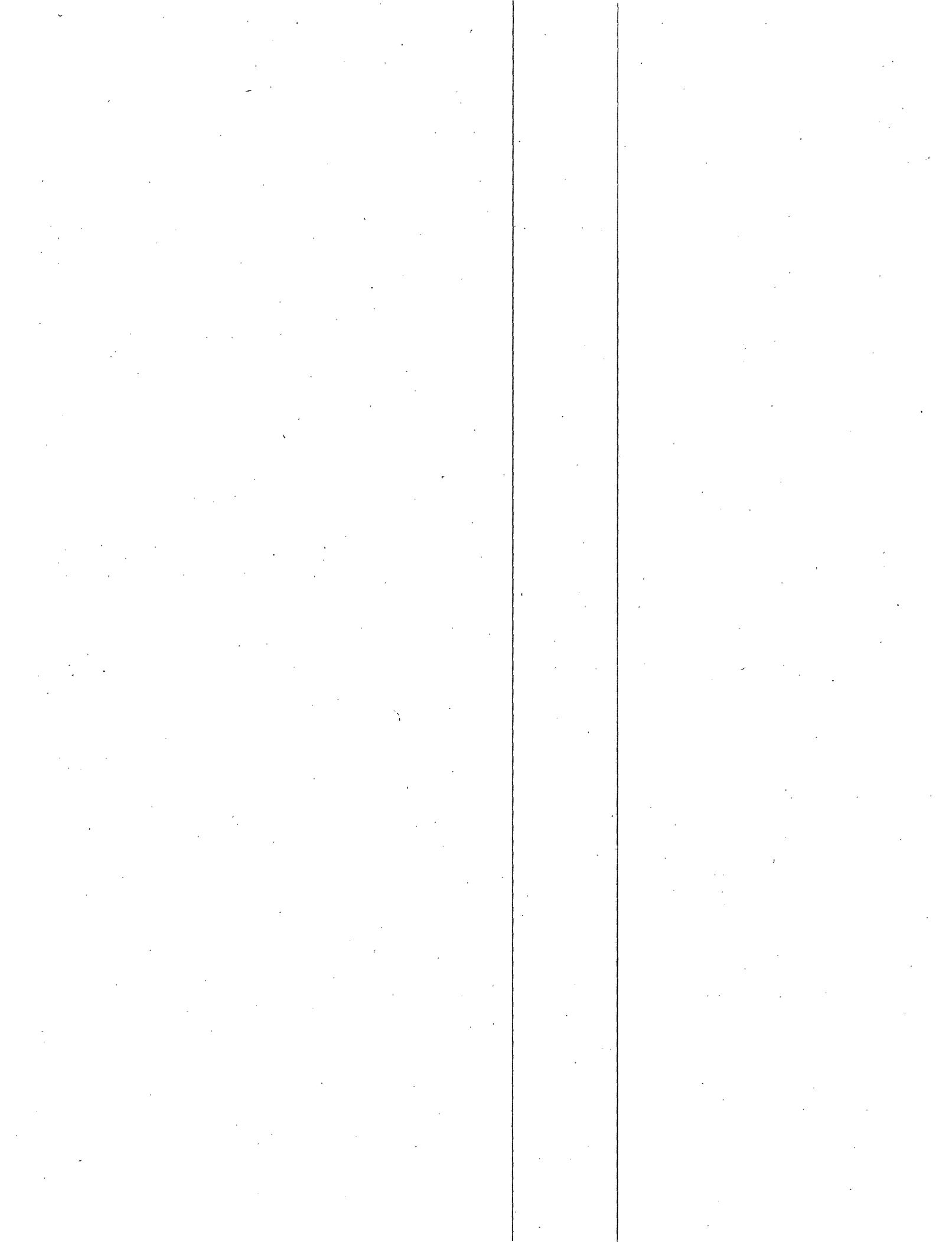
BTEX by Purge-and-Trap Gas Chromatography

Name of Sample: Recovery Well RW-12

Date of Sample	08-Apr-99	Analyte	Peak Area
Date of Analysis	23-Apr-99	Benzene	59,005
Analytical Run Number	024F2401.D	Toluene	44,963
Calibration Run Date	23-Apr-99	Ethylbenzene	0
Average Spike Recoveries, %		p,m - Xylenes	54,581
Benzene	93.6	o - Xylene	283,115
Toluene	93.3		
Ethylbenzene	94.9		
Total Xylenes	92.6	Chemist	Eric Branson

Concentration, mg/L

Benzene	0.07
Toluene	0.06
Ethylbenzene	<0.01
Total Xylenes	0.49



Certificate of Analysis

Williams Refining, L.L.C.
Memphis, TN

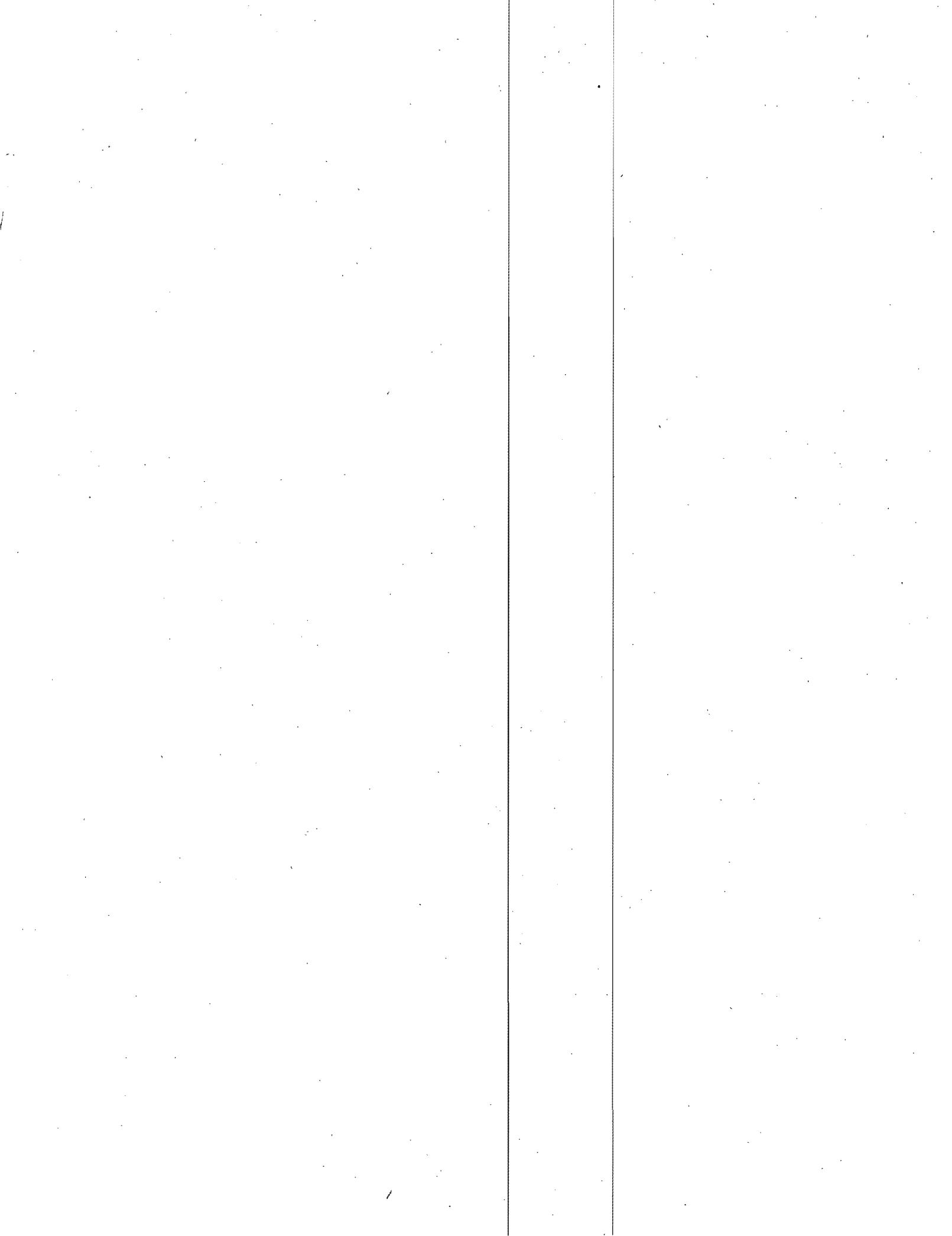
BTEX by Purge-and-Trap Gas Chromatography

Name of Sample: Recovery Well Combined Flow 1-11

Date of Sample	15-Apr-99	Analyte	Peak Area
Date of Analysis	23-Apr-99	Benzene	5,139,730
Analytical Run Number	023F2301.D	Toluene	2,088,330
Calibration Run Date	23-Apr-99	Ethylbenzene	391,083
Average Spike Recoveries, %		p,m - Xylenes	1,403,920
Benzene	93.6		
Toluene	93.3	o - Xylene	522,850
Ethylbenzene	94.9		
Total Xylenes	92.6	Chemist	Eric Branson

Concentration, mg/L

Benzene	6.15
Toluene	0.06
Ethylbenzene	0.60
Total Xylenes	2.64



Certificate of Analysis

Williams Refining, L.L.C.
Memphis, TN

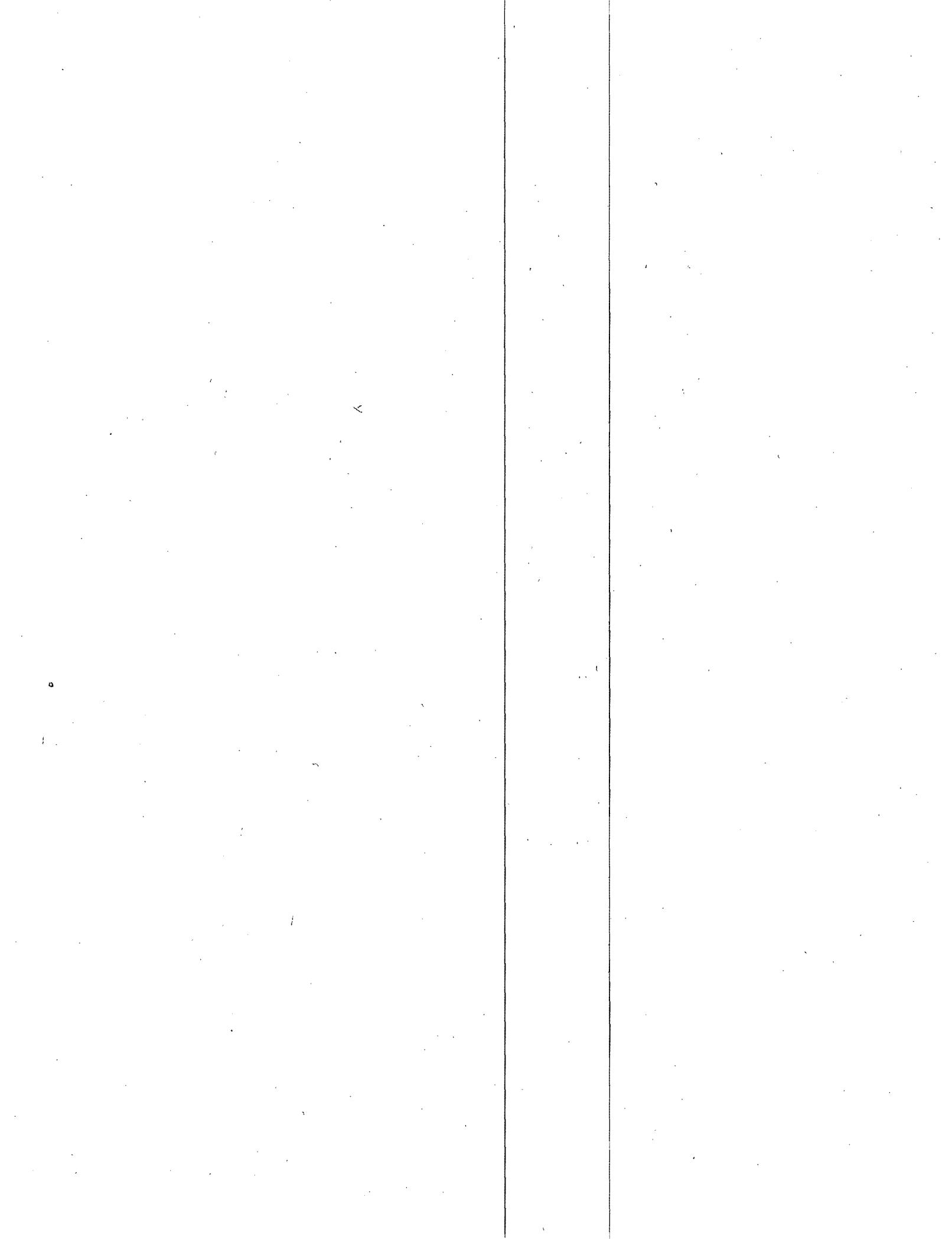
BTEX by Purge-and-Trap Gas Chromatography

Name of Sample: Recovery Well RW-12

Date of Sample	15-Apr-99	Analyte	Peak Area
Date of Analysis	23-Apr-99	Benzene	1,986,940
Analytical Run Number	025F2501.D	Toluene	1,705,720
Calibration Run Date	23-Apr-99	Ethylbenzene	0
Average Spike Recoveries, %		p,m - Xylenes	1,202,800
Benzene	93.6	o - Xylene	513,052
Toluene	93.3		
Ethylbenzene	94.9	Chemist	Eric Branson
Total Xylenes	92.6		

Concentration, mg/L

Benzene	2.38
Toluene	2.25
Ethylbenzene	<0.01
Total Xylenes	2.36



Certificate of Analysis

Williams Refining, L.L.C.
Memphis, TN

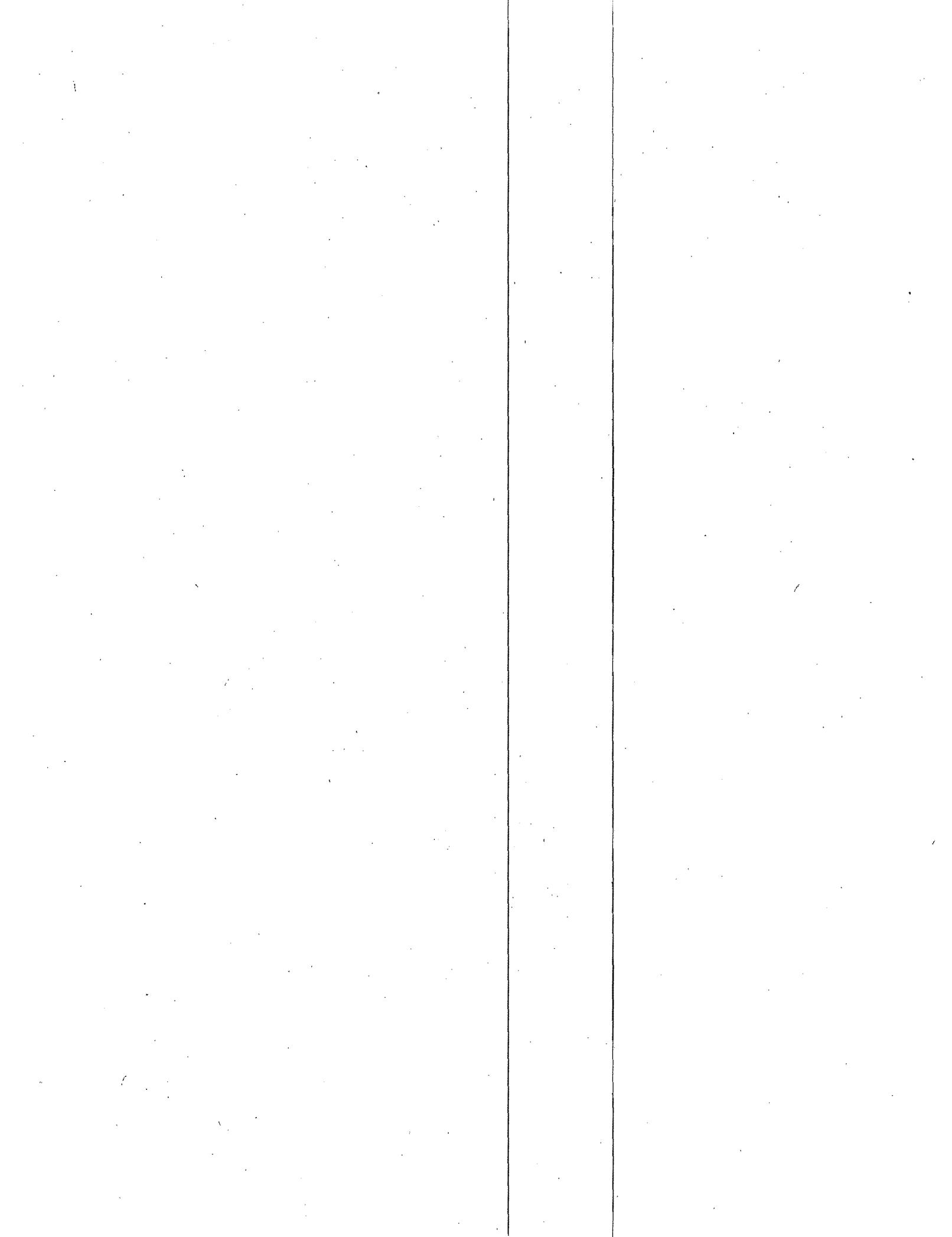
BTEX by Purge-and-Trap Gas Chromatography

Name of Sample: Recovery Well Combined Flow 1-11

Date of Sample	25-May-99	Analyte	Peak Area
Date of Analysis	08-Jun-99	Benzene	7,673,840
Analytical Run Number	014F1401.D	Toluene	4,387,370
Calibration Run Date	24-May-99	Ethylbenzene	554,394
Average Spike Recoveries, %		p,m - Xylenes	1,956,750
Benzene	93.6	o - Xylene	630,137
Toluene	93.3		
Ethylbenzene	94.9		
Total Xylenes	92.6	Chemist	Eric Branson

Concentration, mg/L

Benzene	11.66
Toluene	7.11
Ethylbenzene	1.00
Total Xylenes	5.25

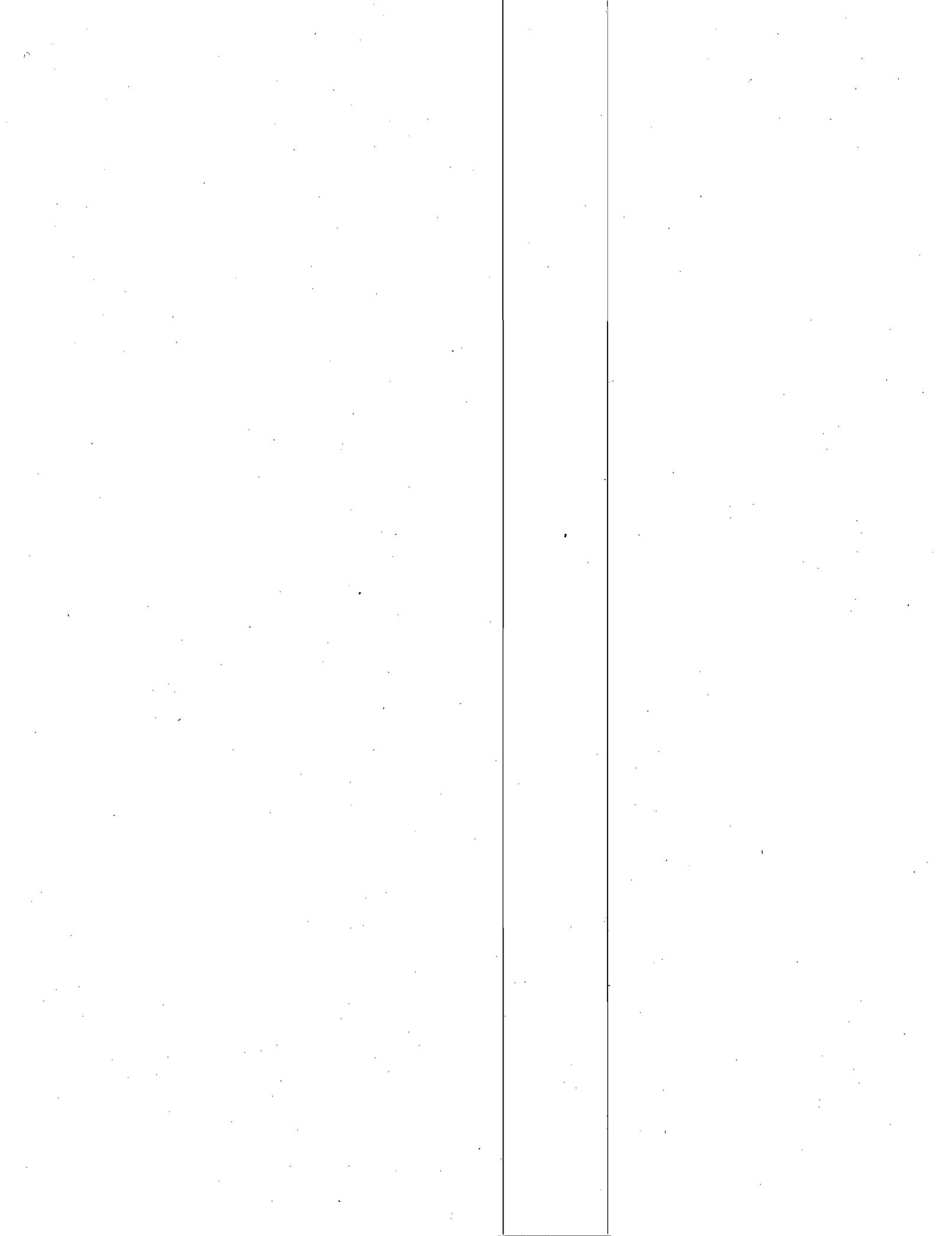


Certificate of Analysis

Williams Refining, L.L.C.
Memphis, TN

BTEX by Purge-and-Trap Gas Chromatography

Name of Sample: Recovery Well RW-12			
Date of Sample	25-May-99	Analyte	Peak Area
Date of Analysis	08-Jun-99	Benzene	1,192,820
Analytical Run Number	015F1501.D	Toluene	1,577,870
Calibration Run Date	24-May-99	Ethylbenzene	90,339
Average Spike Recoveries, %		p,m - Xylenes	698,876
Benzene	93.6	o - Xylene	238,140
Toluene	93.3		
Ethylbenzene	94.9	Chemist	Eric Branson
Total Xylenes	92.6		
Concentration, mg/L			
Benzene	1.81		
Toluene	2.56		
Ethylbenzene	0.16		
Total Xylenes	1.91		



Certificate of Analysis

Williams Refining, L.L.C.
Memphis, TN

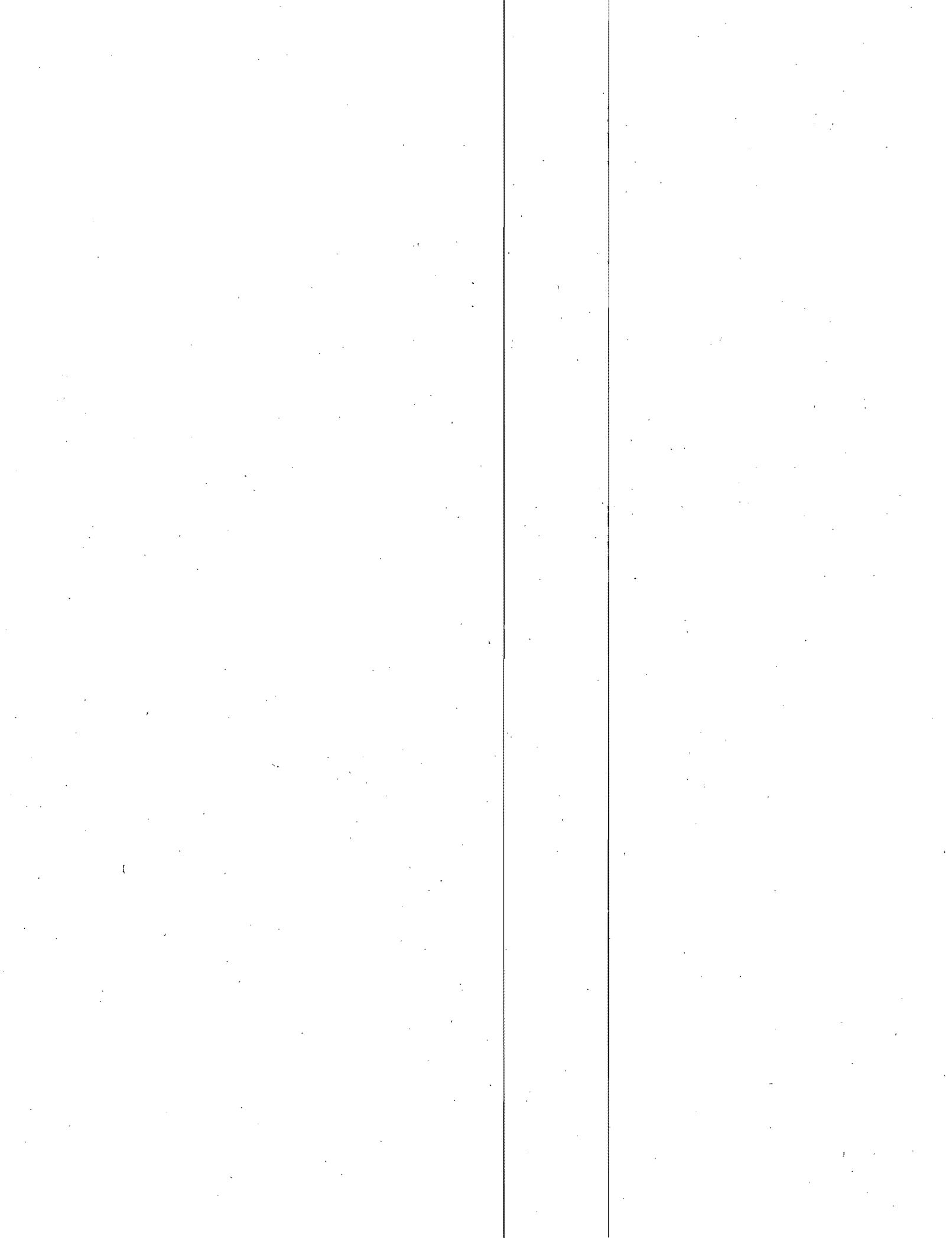
BTEX by Purge-and-Trap Gas Chromatography

Name of Sample: Recovery Well Combined Flow 1-11

Date of Sample	28-Jun-99	Analyte	Peak Area
Date of Analysis	28-Jun-99	Benzene	9,616,000
Analytical Run Number	006F0601.D	Toluene	6,204,050
Calibration Run Date	25-Jun-99	Ethylbenzene	760,421
Average Spike Recoveries, %		p,m - Xylenes	2,746,330
Benzene	93.6	o - Xylene	880,943
Toluene	93.3		
Ethylbenzene	94.9		
Total Xylenes	92.6	Chemist	Eric Branson

Concentration, mg/L

Benzene	12.67
Toluene	8.50
Ethylbenzene	1.15
Total Xylenes	5.73



Certificate of Analysis

Williams Refining, L.L.C.
Memphis, TN

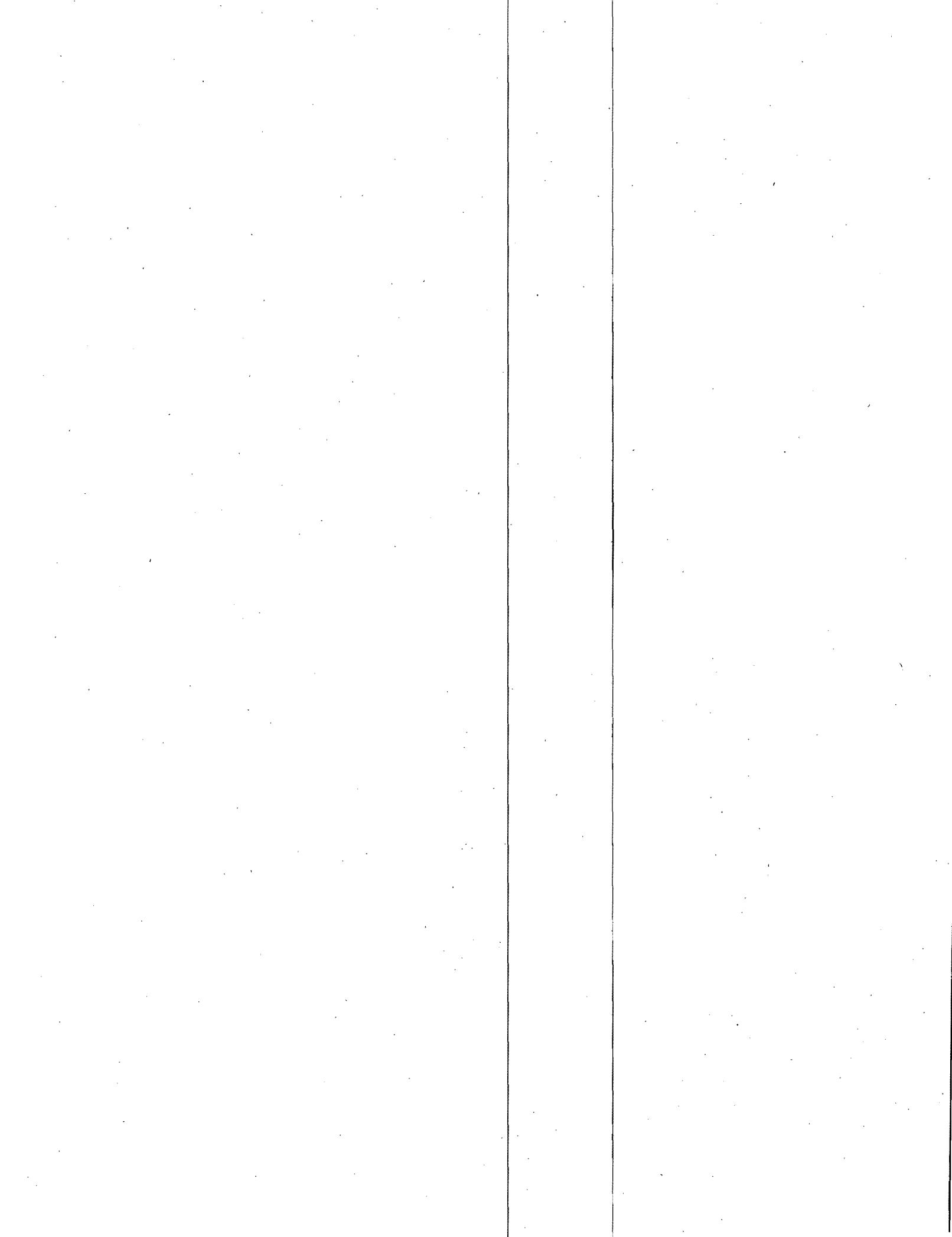
BTEX by Purge-and-Trap Gas Chromatography

Name of Sample: Recovery Well RW-12

Date of Sample	28-Jun-99	Analyte	Peak Area
Date of Analysis	28-Jun-99	Benzene	2,662,510
Analytical Run Number	005F0501.D	Toluene	7,031,300
Calibration Run Date	25-Jun-99	Ethylbenzene	838,287
Average Spike Recoveries, %		p,m - Xylenes	5,512,360
Benzene	93.6		
Toluene	93.3	o - Xylene	1,864,970
Ethylbenzene	94.9		
Total Xylenes	92.6	Chemist	Eric Branson

Concentration, mg/L

Benzene	3.51
Toluene	9.64
Ethylbenzene	1.27
Total Xylenes	11.66



Certificate of Analysis

Williams Refining, L.L.C.
Memphis, TN

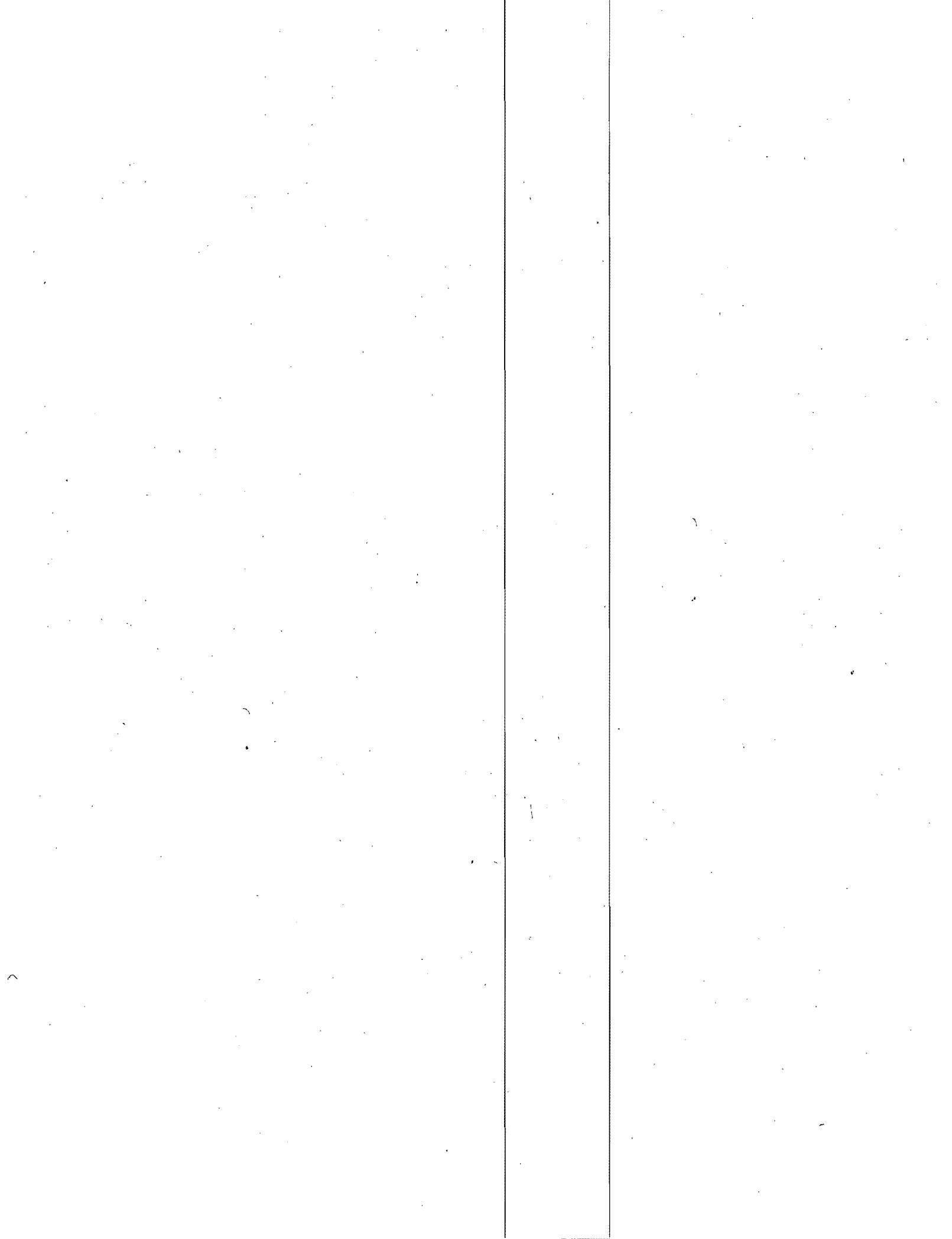
BTEX by Purge-and-Trap Gas Chromatography

Name of Sample: Recovery Well Combined Flow 1-11

Date of Sample	13-Aug-99	Analyte	Peak Area
Date of Analysis	13-Aug-99	Benzene	4,317,110
Analytical Run Number	012F1201.D	Toluene	1,761,210
Calibration Run Date	06-Aug-99	Ethylbenzene	216,290
Average Spike Recoveries, %		p,m - Xylenes	811,937
Benzene	81.0	o - Xylene	291,896
Toluene	80.1		
Ethylbenzene	79.9		
Total Xylenes	80.1	Chemist	Eric Branson

Concentration, mg/L

Benzene	7.34
Toluene	3.13
Ethylbenzene	0.44
Total Xylenes	2.01



Certificate of Analysis

Williams Refining, L.L.C.
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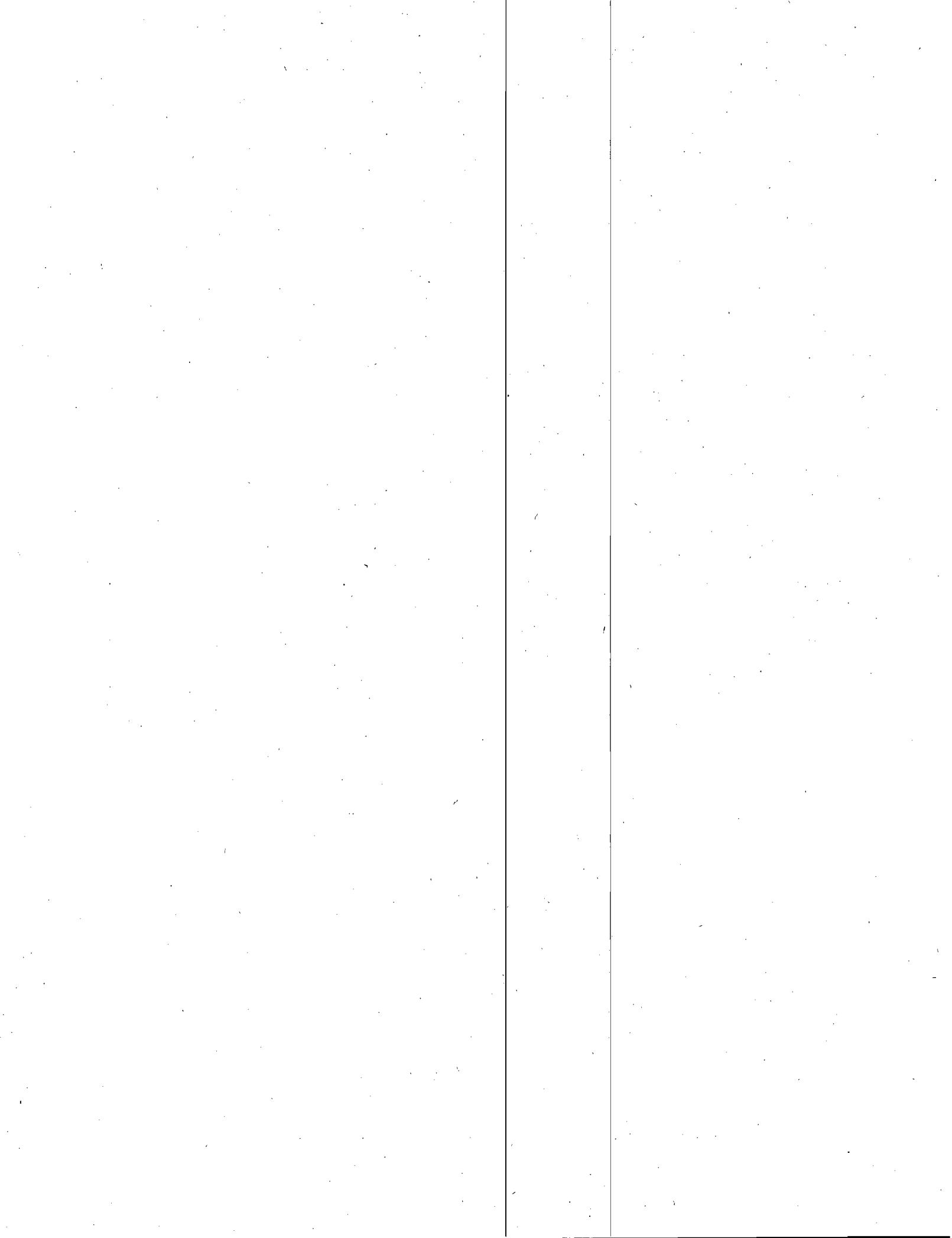
BTEX by Purge-and-Trap Gas Chromatography

Name of Sample: Recovery Well RW-12

Date of Sample	13-Aug-99	Analyte	Peak Area
Date of Analysis	13-Aug-99	Benzene	593,672
Analytical Run Number	011F1101.D	Toluene	1,076,760
Calibration Run Date	06-Aug-99	Ethylbenzene	140,344
Average Spike Recoveries, %		p,m - Xylenes	884,180
Benzene	81.0	o - Xylene	344,676
Toluene	80.1		
Ethylbenzene	79.9		
Total Xylenes	80.1	Chemist	Eric Branson

Concentration, mg/L

Benzene	1.01
Toluene	1.91
Ethylbenzene	0.29
Total Xylenes	2.25



Certificate of Analysis

Williams Refining, L.L.C.
Memphis, TN

BTEX by Purge-and-Trap Gas Chromatography

Name of Sample: Recovery Well Combined Flow 1-11

Date of Sample	01-Sep-99	Analyte	Peak Area
Date of Analysis	01-Sep-99	Benzene	4,985,450
Analytical Run Number	009F0901.D	Toluene	1,927,250
Calibration Run Date	25-Aug-99	Ethylbenzene	220,117
Average Spike Recoveries, %		p,m - Xylenes	900,019
Benzene	92.3	o - Xylene	321,251
Toluene	92.1		
Ethylbenzene	93.3	Chemist	Eric Branson
Total Xylenes	93.1		

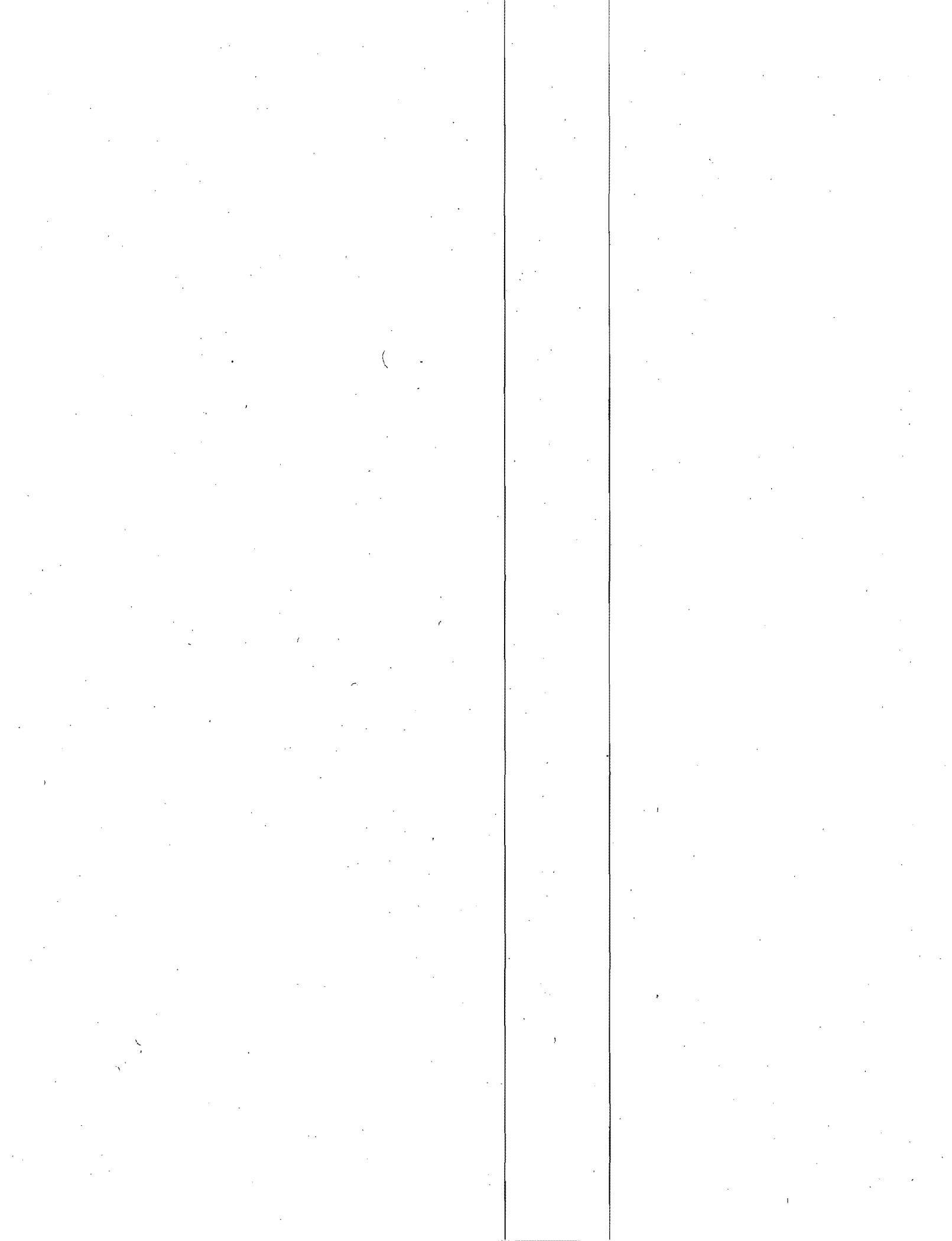
Concentration, mg/L

Benzene 11.14

Toluene 4.56

Ethylbenzene 0.61

Total Xylenes 2.99



Certificate of Analysis

Williams Refining, L.L.C.
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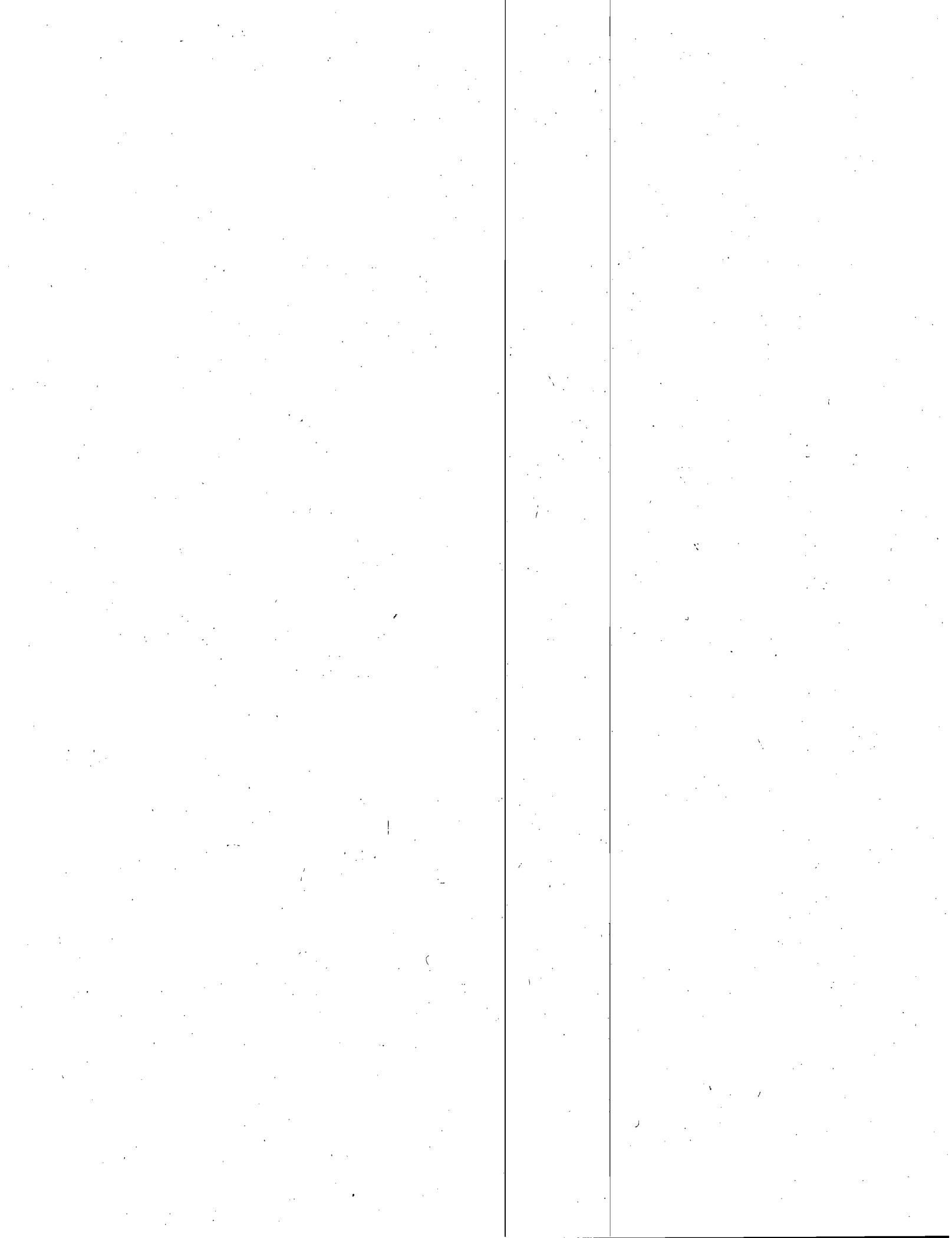
BTEX by Purge-and-Trap Gas Chromatography

Name of Sample: Recovery Well RW-12

Date of Sample	01-Sep-99	Analyte	Peak Area
Date of Analysis	01-Sep-99	Benzene	3,734,330
Analytical Run Number	008F0801.D	Toluene	6,906,190
Calibration Run Date	25-Aug-99	Ethylbenzene	544,703
Average Spike Recoveries, %		p,m - Xylenes	3,368,390
Benzene	92.3		
Toluene	92.1	o - Xylene	1,272,860
Ethylbenzene	93.3		
Total Xylenes	93.1	Chemist	Eric Branson

Concentration, mg/L

Benzene	8.34
Toluene	16.35
Ethylbenzene	1.52
Total Xylenes	11.40



Certificate of Analysis

Williams Refining, L.L.C.
Memphis, TN

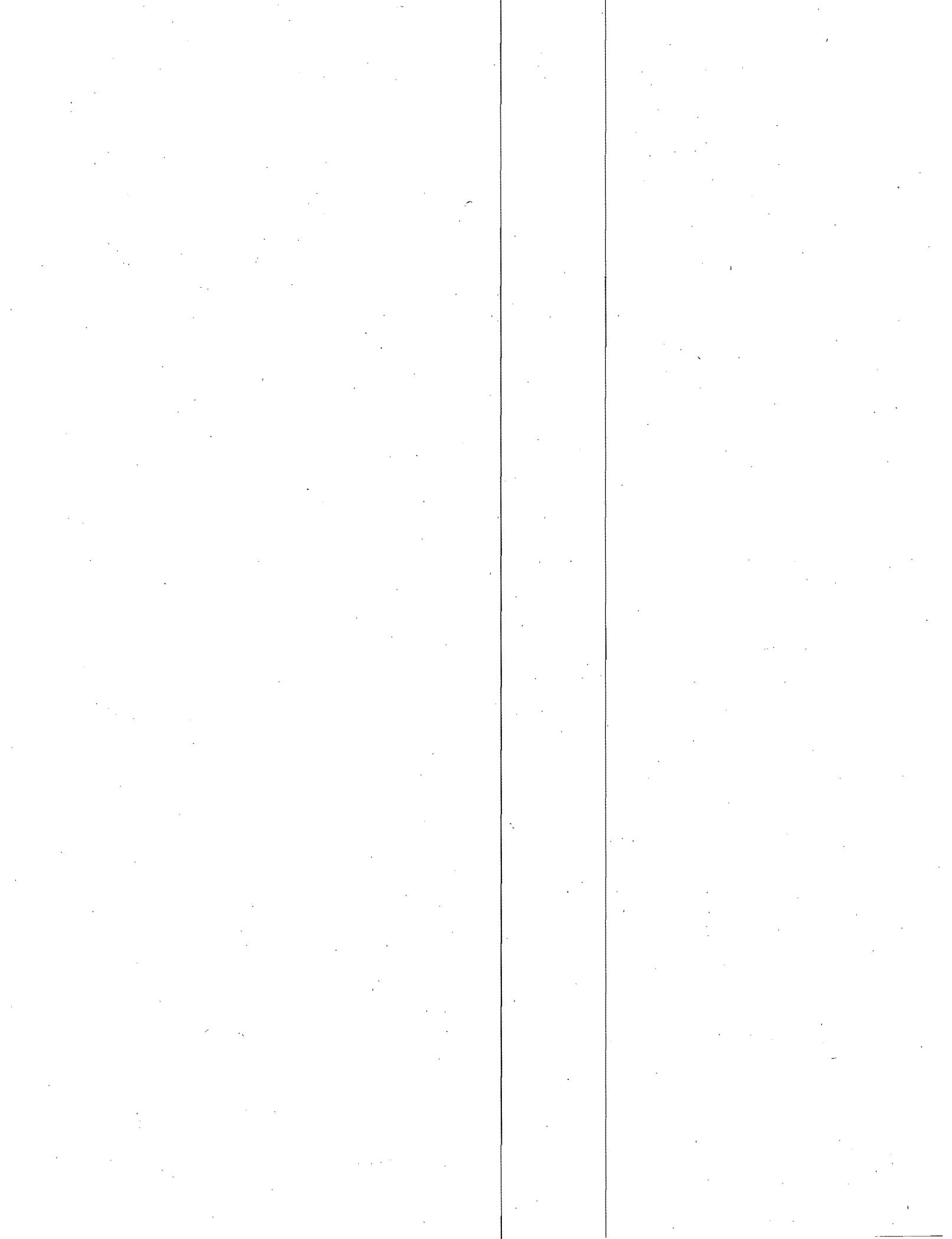
BTEX by Purge-and-Trap Gas Chromatography

Name of Sample: Recovery Well Combined Flow 1-11

Date of Sample	30-Sep-99	Analyte	Peak Area
Date of Analysis	06-Oct-99	Benzene	2,383,340
Analytical Run Number	007F0701.D	Toluene	104,869
Calibration Run Date	30-Sep-99	Ethylbenzene	130,540
Average Spike Recoveries, %		p,m - Xylenes	283,709
Benzene	92.3		
Toluene	92.1	o - Xylene	37,870
Ethylbenzene	93.3		
Total Xylenes	93.1	Chemist	Eric Branson

Concentration, mg/L

Benzene	5.95
Toluene	0.28
Ethylbenzene	0.42
Total Xylenes	0.90



Certificate of Analysis

Williams Refining, L.L.C.
Memphis, TN

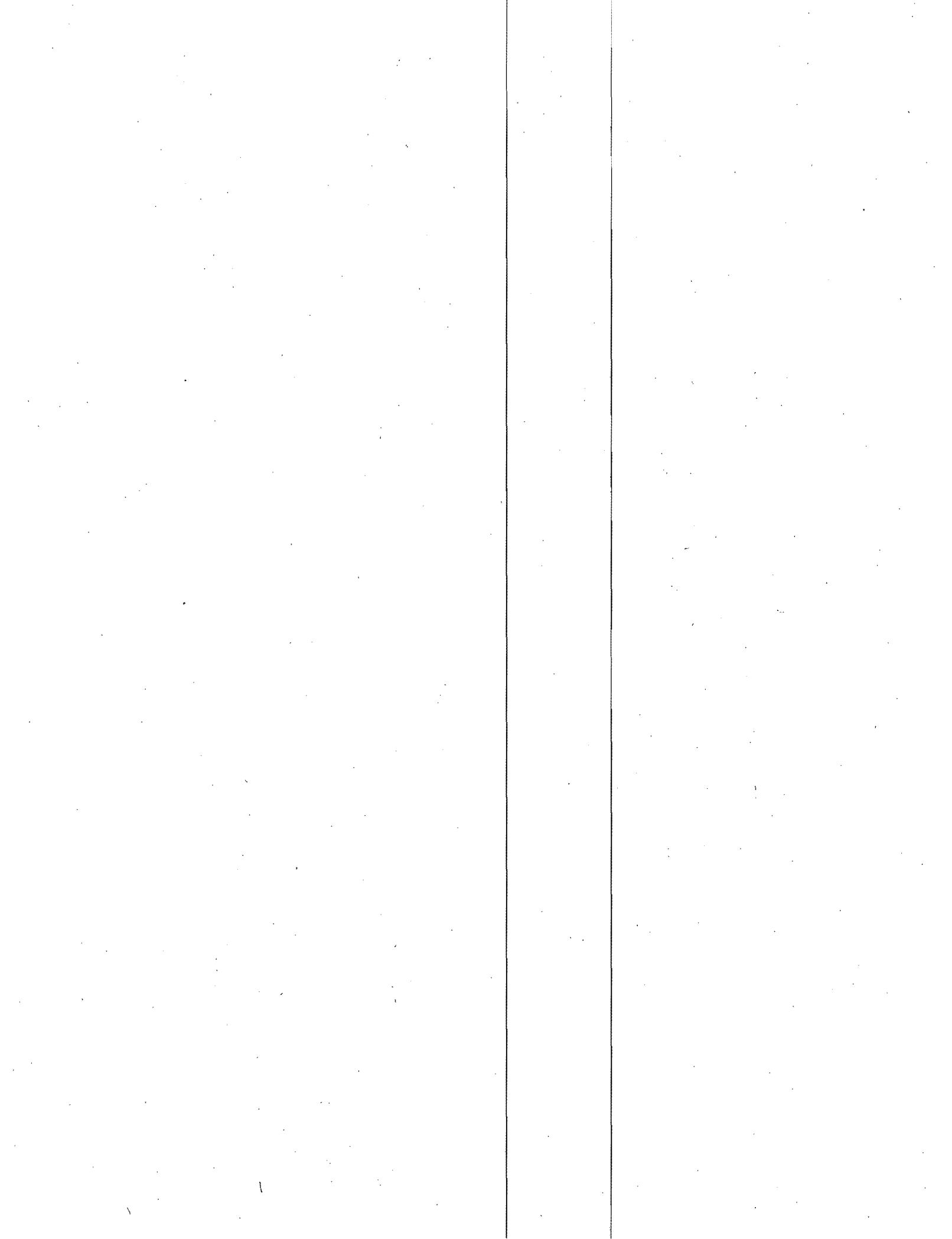
BTEX by Purge-and-Trap Gas Chromatography

Name of Sample: Recovery Well RW-12

Date of Sample	30-Sep-99	Analyte	Peak Area
Date of Analysis	06-Oct-99	Benzene	3,566,290
Analytical Run Number	006F0601.D	Toluene	7,483,060
Calibration Run Date	30-Sep-99	Ethylbenzene	712,078
Average Spike Recoveries, %		p,m - Xylenes	3,673,990
Benzene	92.3		
Toluene	92.1	o - Xylene	1,367,010
Ethylbenzene	93.3		
Total Xylenes	93.1	Chemist	Eric Branson

Concentration, mg/L

Benzene	8.90
Toluene	20.27
Ethylbenzene	2.31
Total Xylenes	14.49





SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A60191
Sample ID: WIL781 RW-12
Sample Type: Water
Site ID:

Project:
Project Name: MTH-APR
Sampler: EB/JMY

Date Collected: 4/27/99
Time Collected:
Date Received: 4/29/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
ORGANIC PARAMETERS										
Gasoline Range Organics	5.11	mg/l	1.00	0.10	10	5/ 2/99	13:35	F. Sundi	TDME	9000
Ext Petroleum Hyd. (EPH)	0.64	mg/l	0.11	0.10	1	5/ 1/99	19:53	K. Walkup	TDME	8685

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol	Extracted	Extract Vol.	Date	Analyst	Method
EPH		895. mL	1.00 mL	4/29/99	M. Caughen	3510

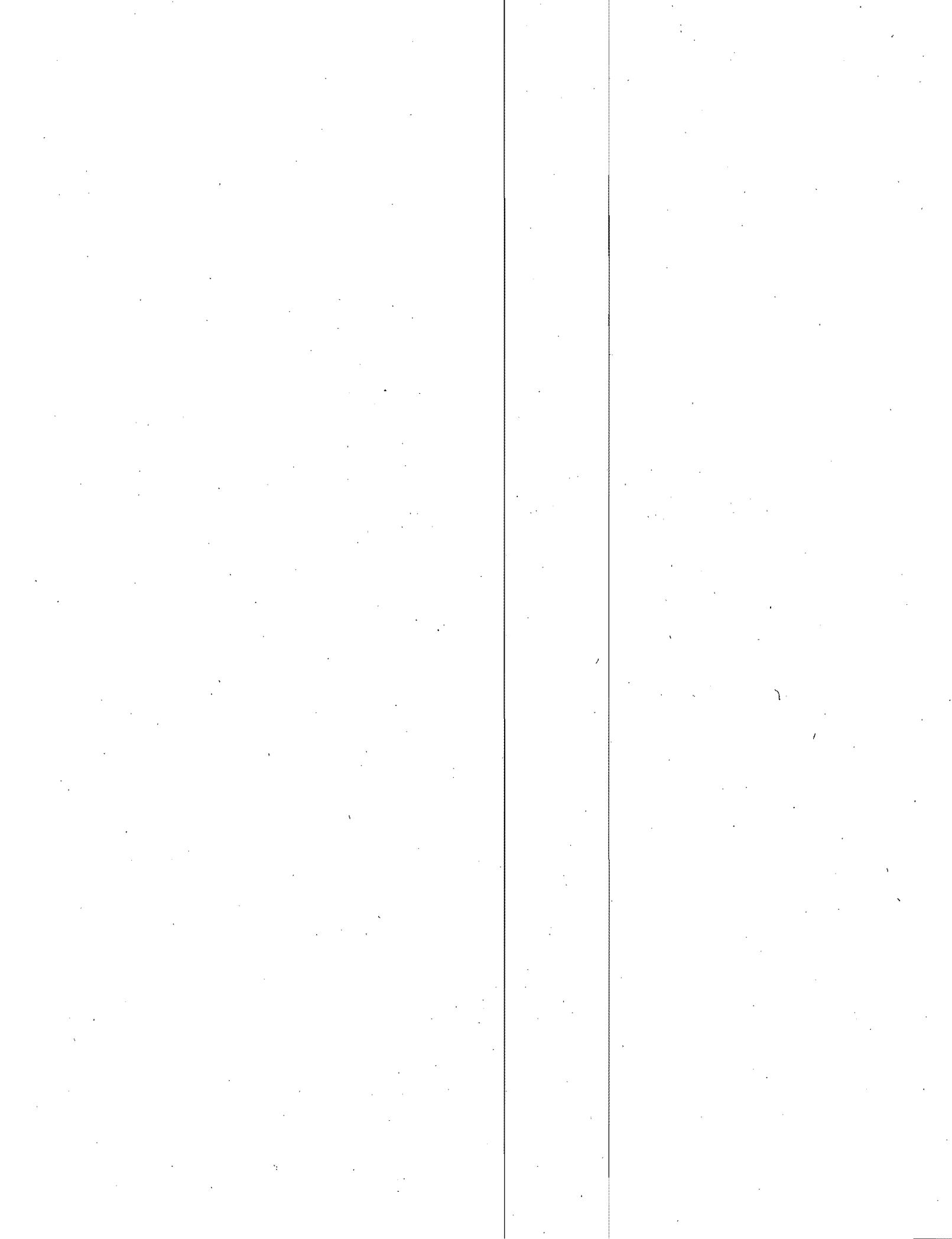
Surrogate	% Recovery	Target Range
surr-o-Terphenyl	80.	50. - 150.
ITEX/GRD Surr., a,a,a-trifluorotoluene	100.	50. - 150.

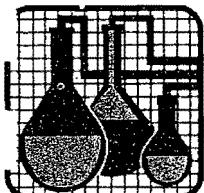
Report Approved By:

Report Date: 5/ 6/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Russell Morgan, Technical Services

Laboratory Certification Number: 02008





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2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A60192
Sample ID: WIL782 RW-Comb
Sample Type: Water
Site ID:

Project:
Project Name: MTH-APR
Sampler: EB/JMY

Date Collected: 4/27/99
Time Collected:
Date Received: 4/29/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Ruan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
MORGANIC PARAMETERS*										
Gasoline Range Organics	31.8	mg/l	5.00	0.10	50	5/ 2/99	22:06	F.Gundi	TDHE	9000
Ext Petroleum Hyd. (EPH)	2.08	mg/l	0.11	0.10	1	5/ 2/99	22:26	K.Walkup	TDHE	8685

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol	Extracted	Extract Vol	Date	Analyst	Method
EPH		900. mL	1.00 mL	4/29/99	M. Cauthen	3510

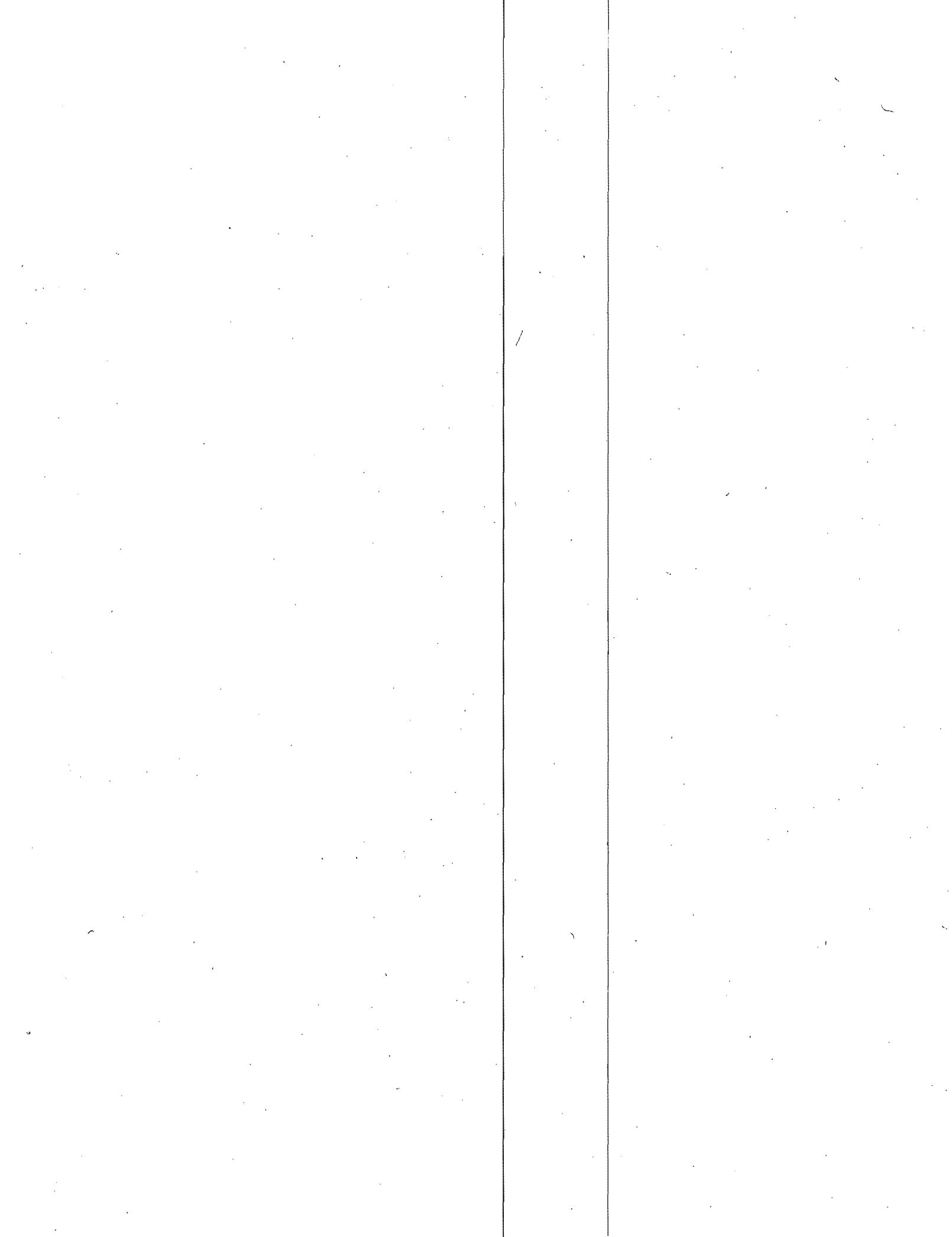
Surrogate	% Recovery	Target Range
surr-o-Terphenyl	85.	50. - 150.
BTEX/GRD Surr., a,a,a-trifluorotoluene	97.	50. - 150.

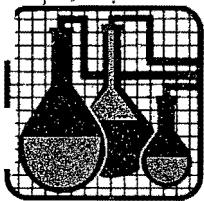
Report Approved By:

Report Date: 5/ 6/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Russell Morgan, Technical Services

Laboratory Certification Number: 02008





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P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

PROJECT QUALITY CONTROL DATA

Matrix Spike Recovery

Analyte	units	Orig. Val.	MS Val	Spike Conc	Recovery	Target Range	Q.C. Batch
Gasoline Range Organics	µg/l	< 0.10	0.19	0.22	86	69. - 127.	9000
Ext Petroleum Hyd. (EPH)	µg/l	< 0.10	4.94	5.00	99	56. - 126.	8685
Sulfate	µg/l	10.0	24.5	15.0	97	47. - 139.	703

Matrix Spike Duplicate

Analyte	units	Orig. Val.	Duplicate	RPD	Limit	Q.C. Batch
Gasoline Range Organics	µg/l	0.19	0.21	10.00	20.	9000
Ext Petroleum Hyd. (EPH)	µg/l	4.94	5.31	7.22	29.	8685
Sulfate	µg/l	24.5	24.6	0.41	4.	703

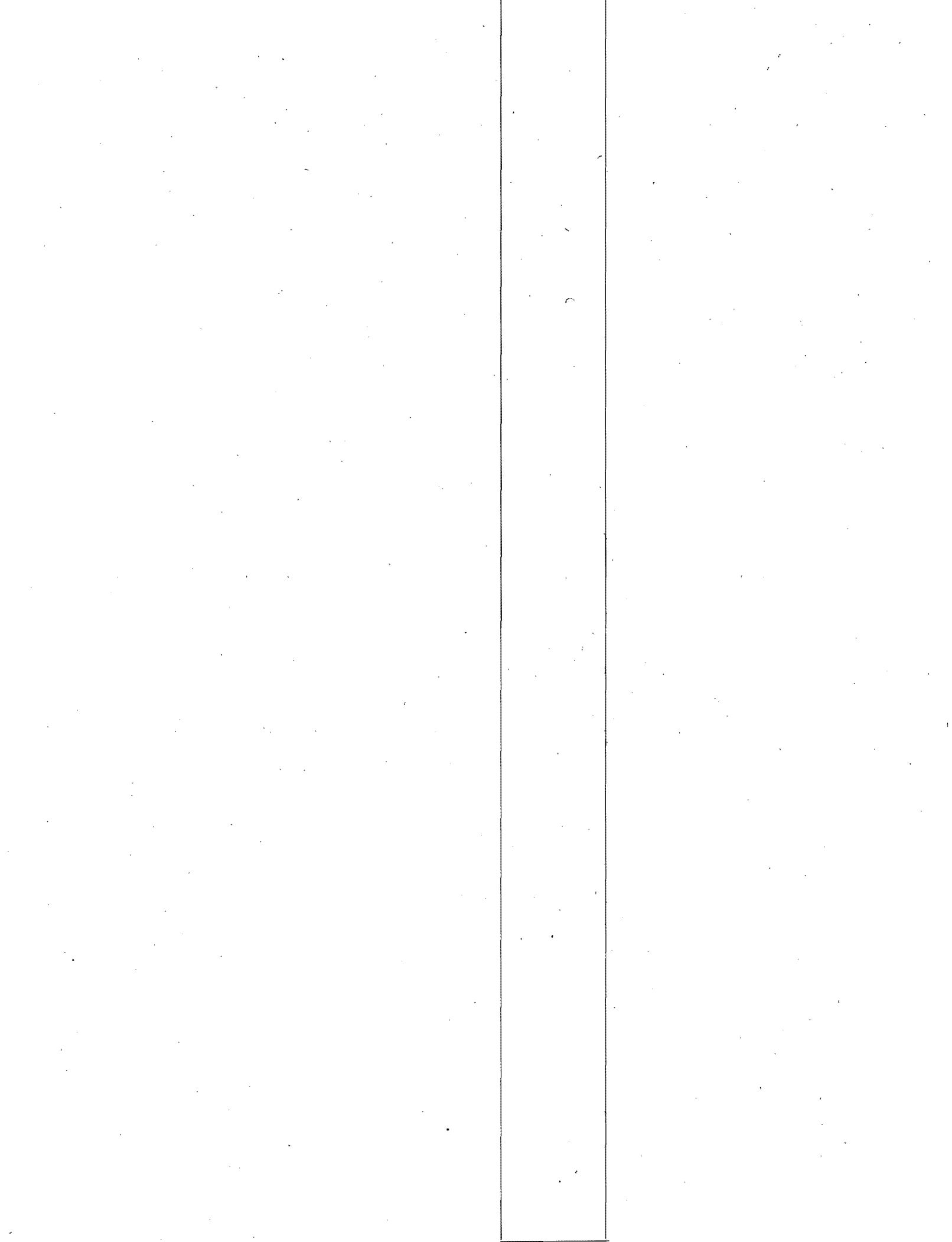
Laboratory Control Data

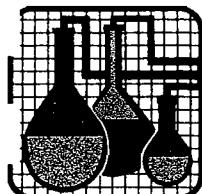
Analyte	units	Known Val.	Analyzed Val	% Recovery	Target Range	Q.C. Batch
Gasoline Range Organics	µg/l	0.22	0.19	86	60 - 140	9000
Ext Petroleum Hyd. (EPH)	µg/l	5.00	4.96	99	60 - 140	8685
Sulfate	µg/l	150.	154.	103	80 - 120	703
Biochemical Oxygen Demand	µg/l	198.	190.	96	80 - 120	6856

Analyte	units	Orig. Val.	Duplicate	RPD	Limit	Q.C. Batch
Biochemical Oxygen Demand	mg/l	55.8	63.5	12.91	15.	6856

Blank Data

Analyte	Blank Value	Units	Q.C. Batch
Gasoline Range Organics	< 0.10	µg/l	9000
Ext Petroleum Hyd. (EPH)	< 0.10	µg/l	8685
Sulfate	< 5.00	µg/l	703





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Phone 1-615-726-0177

ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372

PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A76050
Sample ID: WIL-787 RW-12
Sample Type: Water
Site ID:

Project:
Project Name: MTH-MAY
Sampler: EB/JY

Date Collected: 5/25/99
Time Collected:
Date Received: 5/27/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
ORGANIC PARAMETERS										
Gasoline Range Organics	5.86	mg/l	5.00	0.10	50	6/ 3/99	0:14	T. Johnson	TDHE	6517
Ext Petroleum Hyd. (EPH)	0.66	mg/l	0.10	0.10	1	6/ 3/99	3:49	K. Walkup	TDHE	7400

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol	Extracted	Extract Vol	Date	Analyst	Method
EPH		960. mL	1.00 mL	6/ 2/99	M. Cauthen	3510

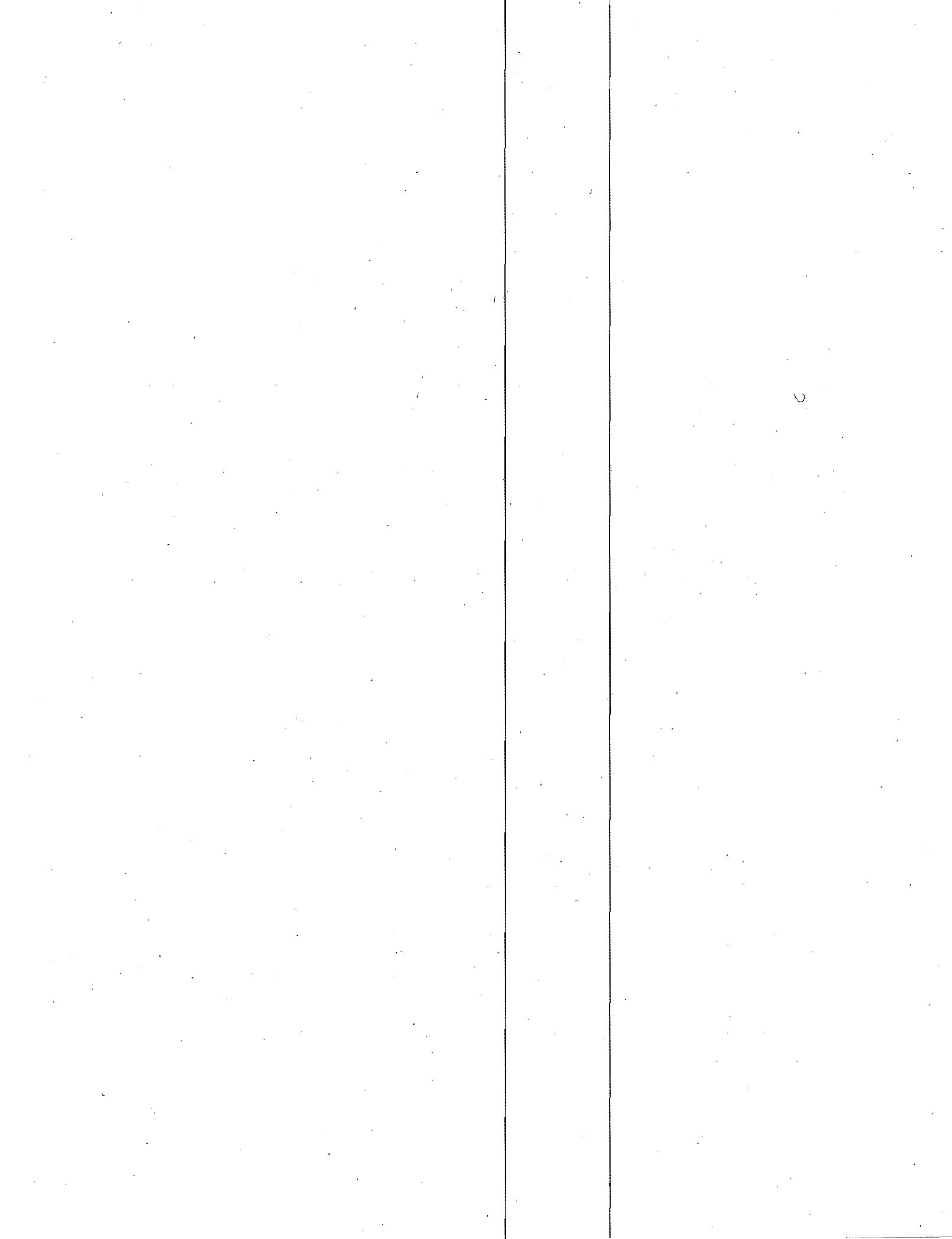
Surrogate	% Recovery	Target Range
curre-o-Terphenyl	83.	50. - 150.
BTEX/Sur., a,a,a-trifluorotoluene	93.	50. - 150.

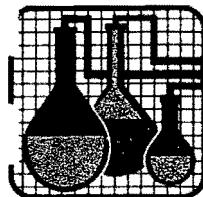
Report Approved By:

Report Date: 6/ 4/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Russell Morgan, Technical Services

Laboratory Certification Number: 02008





SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A76051
Sample ID: WIL-788 RW-Comb
Sample Type: Water
Site ID:

Project:
Project Name: MTH-MAY
Sampler: EB/JY

Date Collected: 5/25/99
Time Collected:
Date Received: 5/27/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
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ORGANIC PARAMETERS

Gasoline Range Organics	14.4	mg/l	5.00	0.10	50	6/ 3/99	0:48	T. Johnson	TDHE	6517
Ext Petroleum Hyd. (EPH)	0.91	mg/l	0.10	0.10	1	6/ 3/99	4:18	K. Walkup	TDHE	7400

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	WT/VOL	Extracted	Extract Vol	Date	Analyst	Method
EPH		980. ml	1.00 ml	6/ 2/99	M. Caughen	3510

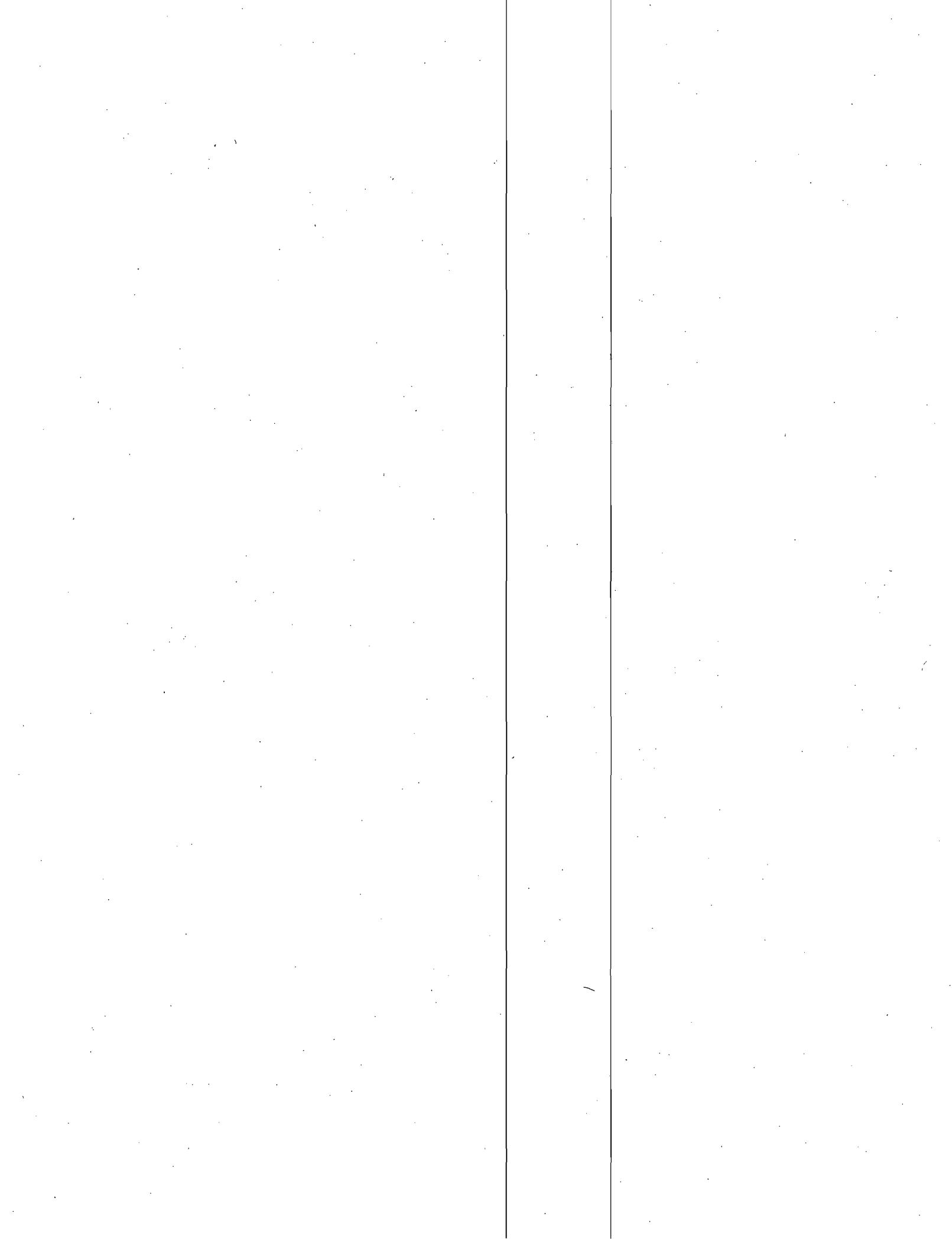
Surrogate	% Recovery	Target Range
corr-o-Terphenyl	75.	50. - 150.
BTEX/GRD Surr., a,a,a-trifluorotoluene	82.	50. - 150.

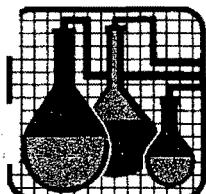
Report Approved By:

Report Date: 6/ 4/99

Theodore J. Dueillo, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Russell Morgan, Technical Services

Laboratory Certification Number: 02008





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Phone 1-615-726-0177

PROJECT QUALITY CONTROL DATA

Matrix Spike Recovery

Analyte	units	Orig. Val.	MS Val	Spike Conc	Recovery	Target Range	R.C. Batch
Gasoline Range Organics	ng/l	< 0.10	0.21	0.22	95	69. - 127.	6517
Ext Petroleum Hyd. (EPH)	ng/l	< 0.10	3.21	5.00	64	56. - 126.	7400

Matrix Spike Duplicate

Analyte	units	Orig. Val.	Duplicate	RFD	Limit	R.C. Batch
Gasoline Range Organics	ng/l	0.21	0.21	0.00	20.	6517
Ext Petroleum Hyd. (EPH)	ng/l	3.21	3.37	4.86	29.	7400

Laboratory Control Data

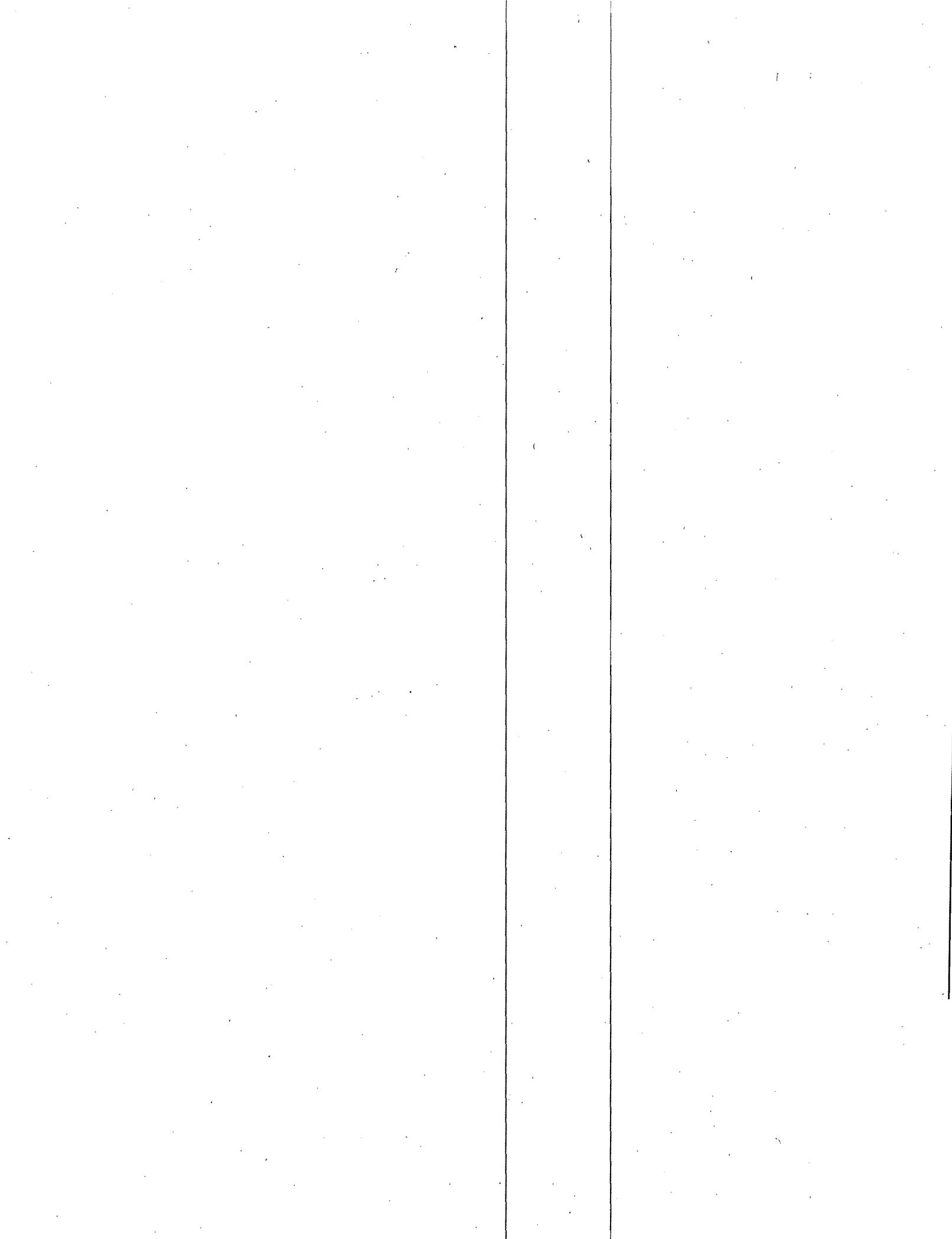
Analyte	units	Known Val.	Analyzed Val	% Recovery	Target Range	R.C. Batch
Gasoline Range Organics	ng/l	0.22	0.21	95	60 - 140	6517
Ext Petroleum Hyd. (EPH)	ng/l	5.00	3.41	68	60 - 140	7400
Naphthalene	ng/l	0.0500	0.0420	84	60 - 140	5651
Chloroform	ng/l	0.0500	0.0570	118	70 - 130	7795
Methylene chloride	ng/l	0.0500	0.0510	102	70 - 130	7795
Sulfate	ng/l	150.	144.	96	80 - 120	6084
Biochemical Oxygen Demand	mg/l	198.	198.	100	80 - 120	6881
Biochemical Oxygen Demand	mg/l	198.	186.	94	80 - 120	6881

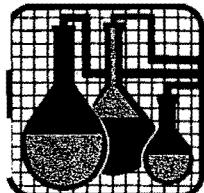
Duplicates

Analyte	units	Orig. Val.	Duplicate	RFD	Limit	R.C. Batch
Biochemical Oxygen Demand	mg/l	< 6.0	< 6.0	N/A	15.	6881
Biochemical Oxygen Demand	mg/l	8.4	8.1	3.64	15.	6881
Biochemical Oxygen Demand	mg/l	< 6.0	< 6.0	N/A	15.	6881
Biochemical Oxygen Demand	mg/l	< 6.0	< 6.0	N/A	15.	6881

Blank Data

Analyte	Blank Value	Units	R.C. Batch
Gasoline Range Organics	< 0.10	ng/l	6517
Ext Petroleum Hyd. (EPH)	< 0.10	ng/l	7400
Sulfate	< 5.00	ng/l	6084
Naphthalene	< 0.0100	ng/l	5651
Chloroform	< 0.0020	ng/l	7795
Methylene chloride	< 0.0020	ng/l	7795





SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A97311
Sample ID: RW-12 WIL 609
Sample Type: Water
Site ID: NOT GIVEN

Project:
Project Name: MTH-JUN
Sampler: E. BRANSON

Date Collected: 6/30/99
Time Collected:
Date Received: 7/1/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
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ANORGANIC PARAMETERS

Gasoline Range Organics	15500	ug/l	1000	100.	10	7/8/99	17:13	Duncan, J.	TDHE	719
Ext Petroleum Hyd. (EPH)	22900	ug/l	1020	100.	10	7/8/99	0:59	K.Walkup	TDHE	85

ND = Not detected at the report limit.

Sample Extraction Data

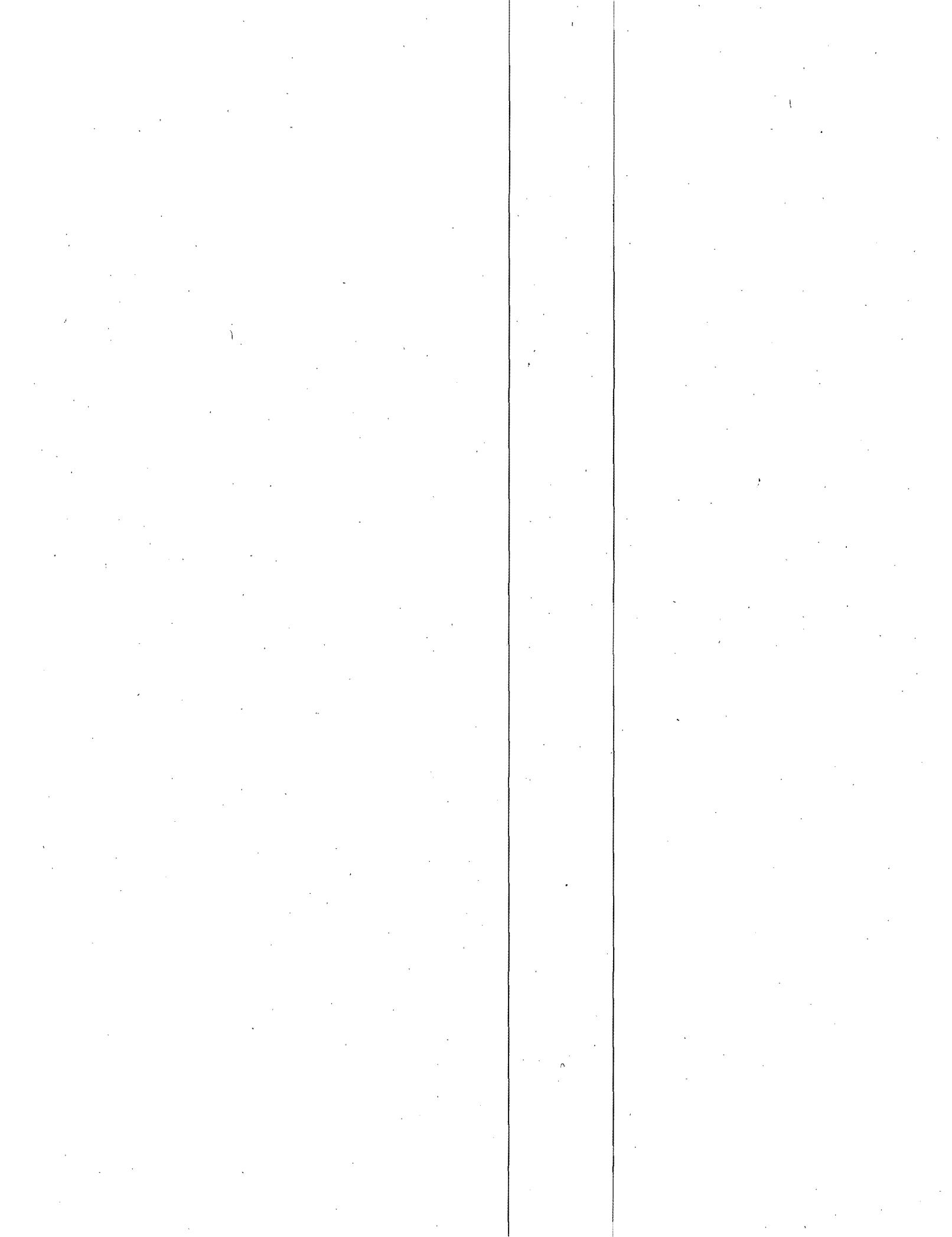
Parameter	Extracted	Extract Vol	Date	Analyst	Method
EPH	980. mL	1.00 mL	7/2/99	Fitzwater	3510

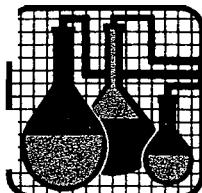
Surrogate	Z Recovery	Target Range
surro-o-Terphenyl	110.	50. - 150.
BTEX/SURR., a,a,a-trifluorotoluene	98.	50. - 150.

Report Approved By: Theodore J. Duello Report Date: 7/16/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lange, Technical Services

Laboratory Certification Number: 02008





SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A97312
Sample ID: RW-COMB WIL 810
Sample Type: Water
Site ID: NOT GIVEN

Project:
Project Name: MTH-JUN
Sampler: E. BRANSON

Date Collected: 6/30/99
Time Collected:
Date Received: 7/ 1/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Run Limit	Dil Factor	Date	Time	Analyst	Method	Batch
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ORGANIC PARAMETERS

Gasoline Range Organics	42000	ug/l	5000	100.	50	7/ 9/99	17:44	Duncan, J.	TDHE	719.
Ext Petroleum Hyd. (EPH)	1440	ug/l	103.	100.	1	7/ 8/99	1:46	K. Walkup	TDHE	85

ND = Not detected at the report limit.

Sample Extraction Data

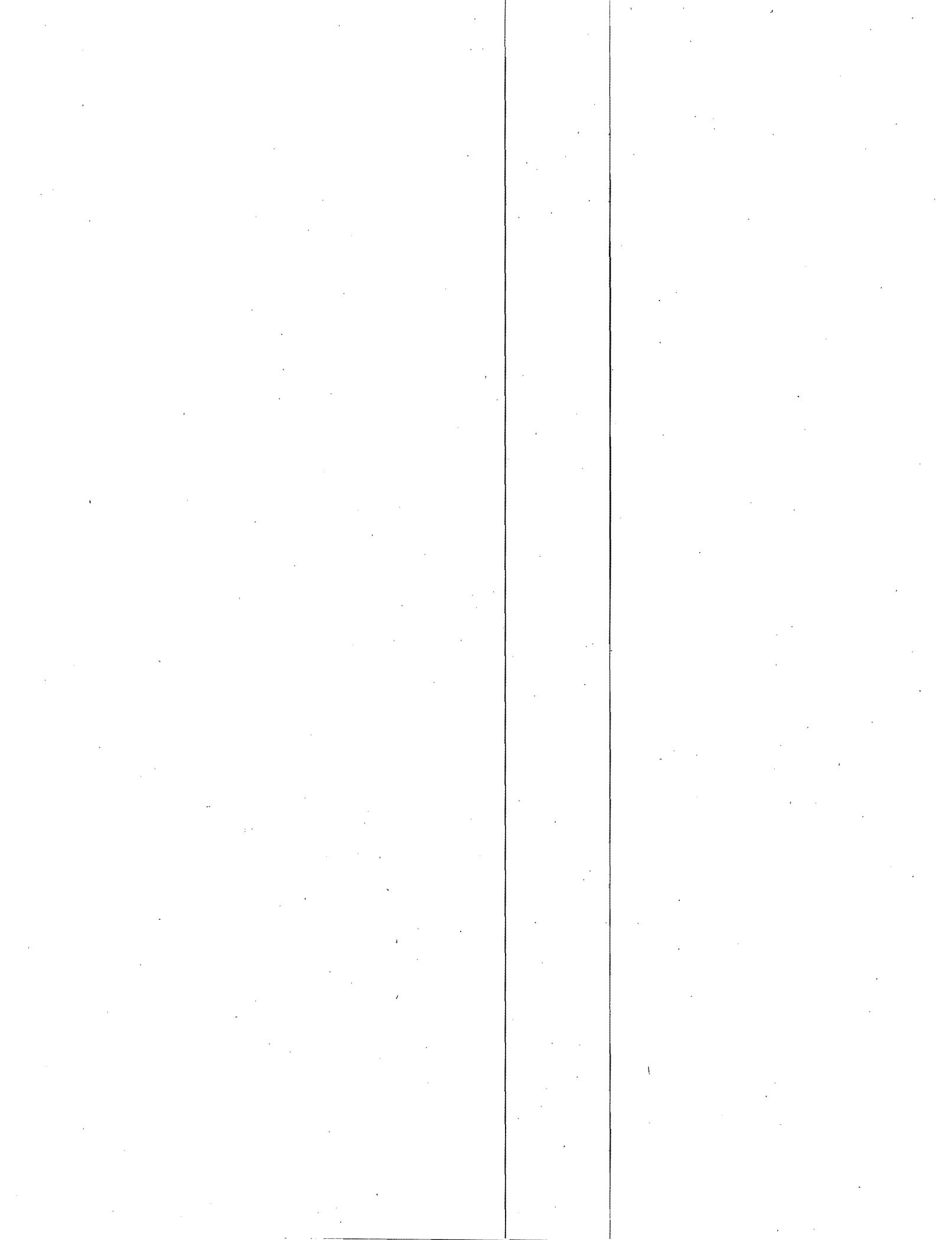
Parameter	Extracted	Extract Vol	Date	Analyst	Method
EPH	970. mL	1.00 mL	7/ 2/99	Fitzwater	3510

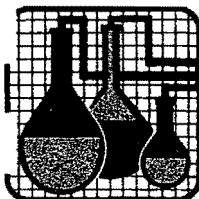
Surrogate	% Recovery	Target Range
o-Terphenyl	91.	50. - 150.
GTEX/GRO Surrogate, a,a,a-trifluorotoluene	97.	50. - 150.

Report Approved By: Michael R. Dunn Report Date: 7/16/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lage, Technical Services

Laboratory Certification Number: 02008





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2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

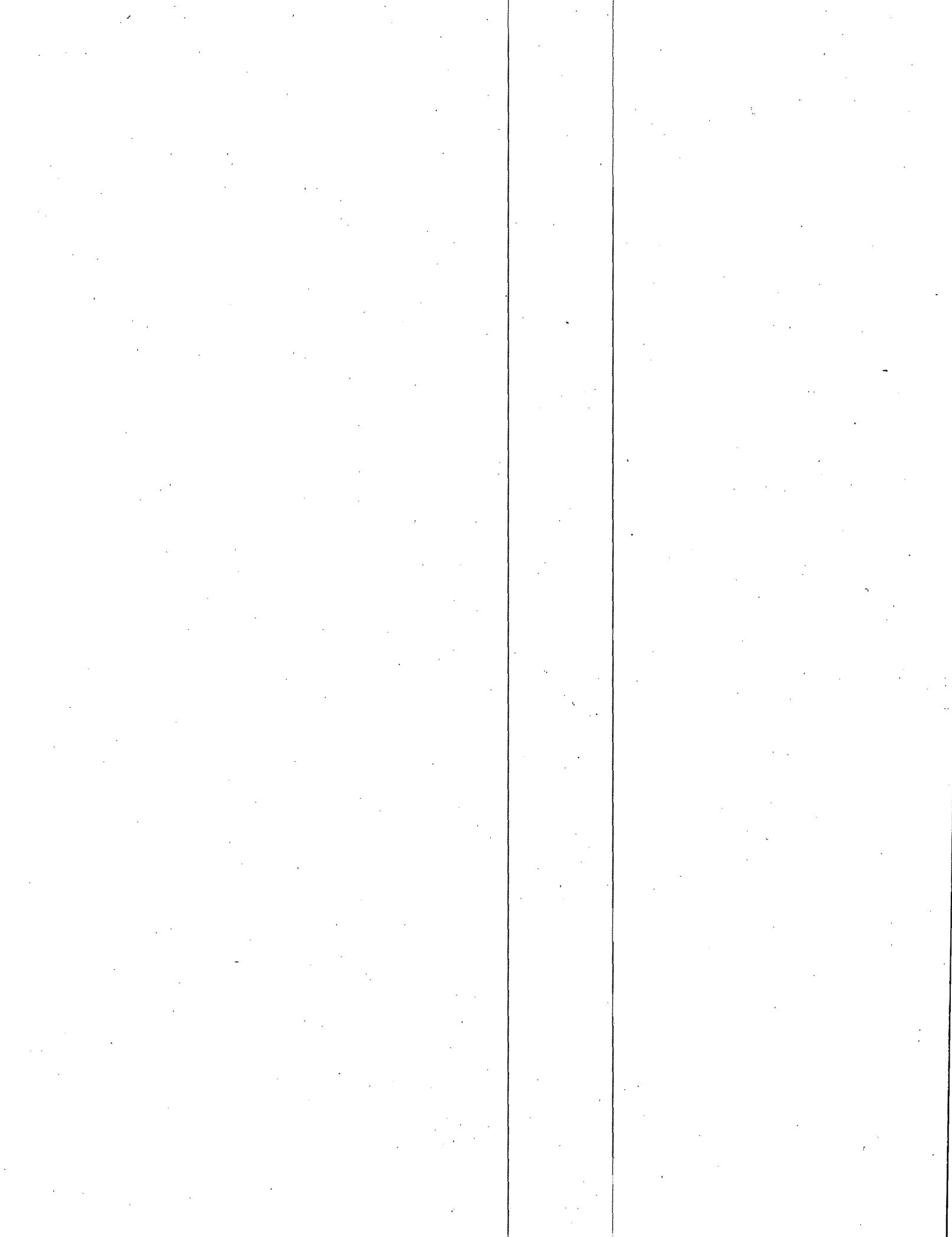
PROJECT QUALITY CONTROL DATA

Matrix Spike Recovery

Analyte	Units	Orig. Val.	ME Val	Spike Concentration	Recovery	Target Range	Q.C. Batch
Gasoline Range Organics	ng/l	< 0.10	0.21	0.22	95	69. - 127.	719
Ext Petroleum Hyd. (EPH)	ng/l	< 0.10	4.94	5.00	99	56. - 126.	85
Sulfate	ng/l	< 5.00	16.0	15.0	107	47. - 139.	6196
Acenaphthene	ng/kg	< 0.330	1.43	3.33	44	29. - 121.	1725
4-Chloro-3-methylphenol	ng/kg	< 0.330	1.55	3.33	47	21. - 128.	1725
2-Chlorophenol	ng/kg	< 0.330	1.42	3.33	43	27. - 107.	1725
1,4-Dichlorobenzene	ng/kg	< 0.330	1.29	3.33	39	20. - 116.	1725
2,4-dinitrotoluene	ng/kg	< 0.330	1.72	3.33	52	22. - 136.	1725
4-Nitrophenol	ng/kg	< 0.825	2.01	3.33	60	20. - 133.	1725
N-nitrosodi-n-propylamine	ng/kg	< 0.330	1.35	3.33	41	31. - 136.	1725
Pentachlorophenol	ng/kg	< 0.825	2.11	3.33	63	10. - 128.	1725
Phenol	ng/kg	< 0.330	1.52	3.33	46	19. - 118.	1725
Pyrene	ng/kg	< 0.330	1.68	3.33	50	14. - 166.	1725
1,2,4-Trichlorobenzene	ng/kg	< 0.330	1.68	3.33	50	16. - 122.	1725
Benzene	ng/kg	< 0.0020	0.0387	0.0500	77	62. - 147.	7413
Benzene	ng/kg	< 0.0020	0.0470	0.0500	94	62. - 147.	1256
Chlorobenzene	ng/kg	< 0.0020	0.0406	0.0500	81	59. - 141.	7413
Chlorobenzene	ng/kg	< 0.0020	0.0490	0.0500	98	59. - 141.	1256
1,1-Dichloroethene	ng/kg	< 0.0020	0.0551	0.0500	110	61. - 143.	7413
1,1-Dichloroethene	ng/kg	< 0.0020	0.0450	0.0500	98	61. - 143.	1256
Toluene	ng/kg	< 0.0020	0.0382	0.0500	116	57. - 156.	7413
Toluene	ng/kg	< 0.0020	0.0470	0.0500	94	57. - 156.	1256
Trichloroethene	ng/kg	< 0.0020	0.0393	0.0500	79	60. - 158.	7413
Trichloroethene	ng/kg	< 0.0020	0.0480	0.0500	96	60. - 158.	1256
Arsenic	ng/kg	< 1.00	18.4	20.0	92	80 - 120	6690
Barium	ng/kg	1.00	371.	408.	92	80 - 120	6690
Cadmium	ng/kg	< 1.00	18.6	20.0	93	80 - 120	6690
Chromium	ng/kg	1.20	38.5	40.0	93	80 - 120	6690
Lead	ng/kg	< 1.00	89.0	100.	89	80 - 120	6690
Mercury	ng/kg	< 0.10	0.18	0.17	106	80 - 120	6303
Nickel	ng/kg	< 1.00	93.6	100.	94	80 - 120	6690
Selenium	ng/kg	< 1.00	18.4	20.0	92	80 - 120	6690
Silver	ng/kg	< 1.00	9.38	10.0	94	80 - 120	6690
Zinc	ng/kg	< 10.0	93.4	100.	93	80 - 120	6690

Matrix Spike Duplicate

Analyte	Units	Orig. Val.	Duplicate	RPD	Limit	Q.C. Batch
Gasoline Range Organics	ng/l	0.21	0.22	4.65	20.	719
Ext Petroleum Hyd. (EPH)	ng/l	4.94	4.95	0.20	20.	85
Sulfate	ng/l	16.0	16.3	1.86	4.	6196
Acenaphthene	ng/kg	1.48	1.65	10.86	64.	1725
4-Chloro-3-methylphenol	ng/kg	1.55	1.72	10.48	54.	1725
2-Chlorophenol	ng/kg	1.42	3.63	87.52%	53.	1725
1,4-Dichlorobenzene	ng/kg	1.29	< 0.330	118.52%	51.	1725





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Phone 1-615-726-0177

ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A113434
Sample ID: WIL-817 RW-Comb
Sample Type: Water
Site ID:

Project:
Project Name: MTH-JULY
Sampler: EB/JY

Date Collected: 7/28/99
Time Collected:
Date Received: 7/30/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
ORGANIC PARAMETERS										
Gasoline Range Organics	15.4	mg/l	10.0	0.10	100	8/ 9/99	14:25	T. Johnson	TDHE	1122
Ext Petroleum Hyd. (EPH)	1.03	mg/l	0.10	0.10	1	8/ 1/99	10:48	K. Walkup	TDHE	5707

ND = Not detected at the report limit.

Sample Extraction Data

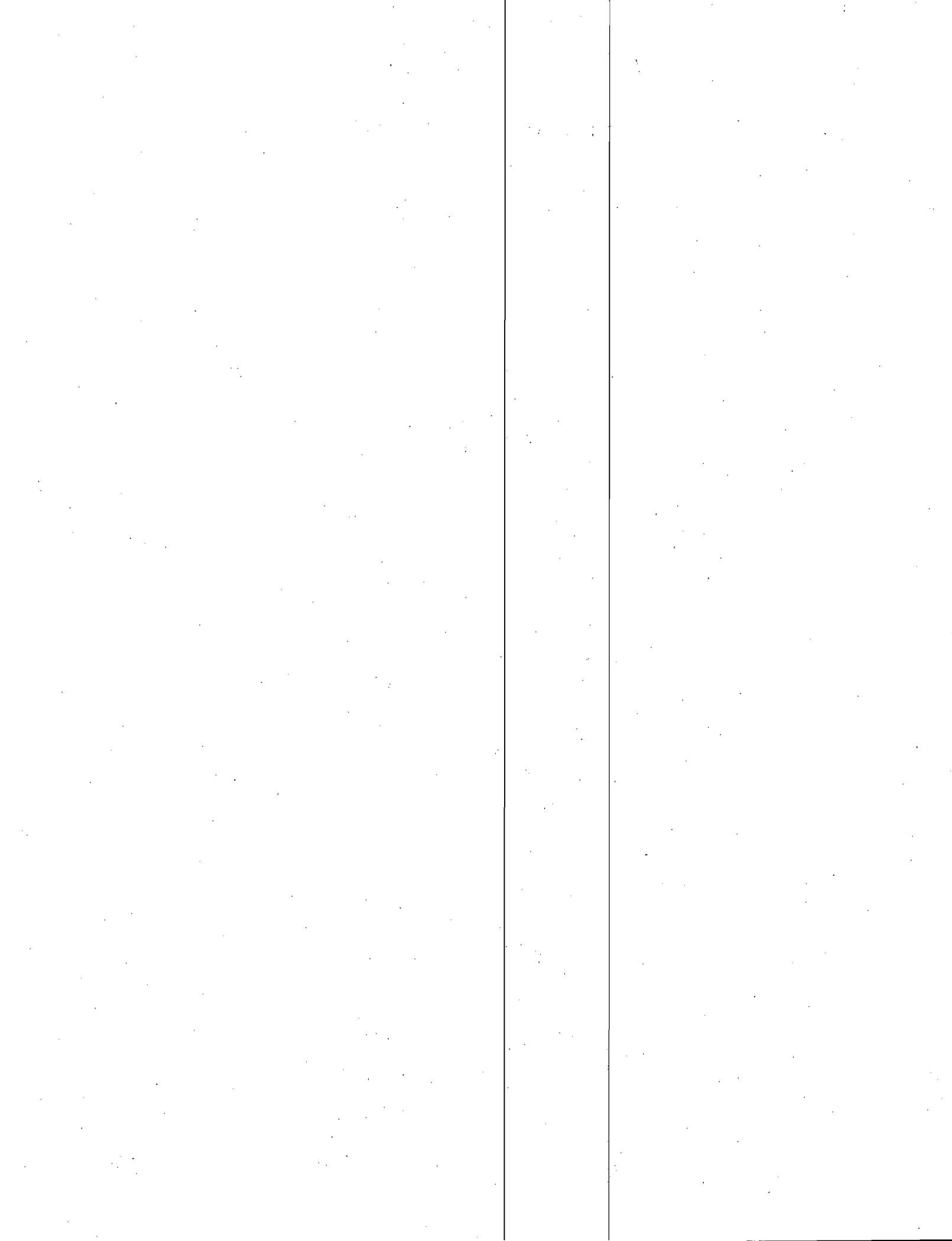
Parameter	Wt/Vol Extracted	Extract Vol	Date	Analyst	Method
EPH	960. mL	1.00 mL	7/31/99	M. Cauthen	3510

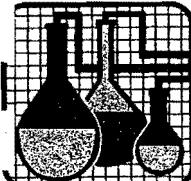
Surrogate	% Recovery	Target Range
surr-o-Terphenyl	117.	50. - 150.
GTEX/GRI Surr., α,α,α -trifluorotoluene	96.	50. - 150.

Report Approved By: Michael A. Dunn Report Date: 8/ 9/99

Theodore J. Dueillo, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lage, Technical Services

Laboratory Certification Number: 02008





SPECIALIZED ASSAYS, INC.

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Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A113435
Sample ID: WIL-818 RW-12
Sample Type: Water
Site ID:

Project:
Project Name: MTH-JULY
Sampler: EB/JY

Date Collected: 7/28/99
Time Collected:
Date Received: 7/30/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
ORGANIC PARAMETERS										
Gasoline Range Organics	8.36	ug/l	2.00	0.10	20	8/ 9/99	14:52	T. Johnson	TDHE	1122
Ext Petroleum Hyd. (EPH)	1.64	ug/l	1.09	0.10	10	8/ 1/99	11:19	K. Walkup	TDHE	5707

ND = Not detected at the report limit.

Sample Extraction Data

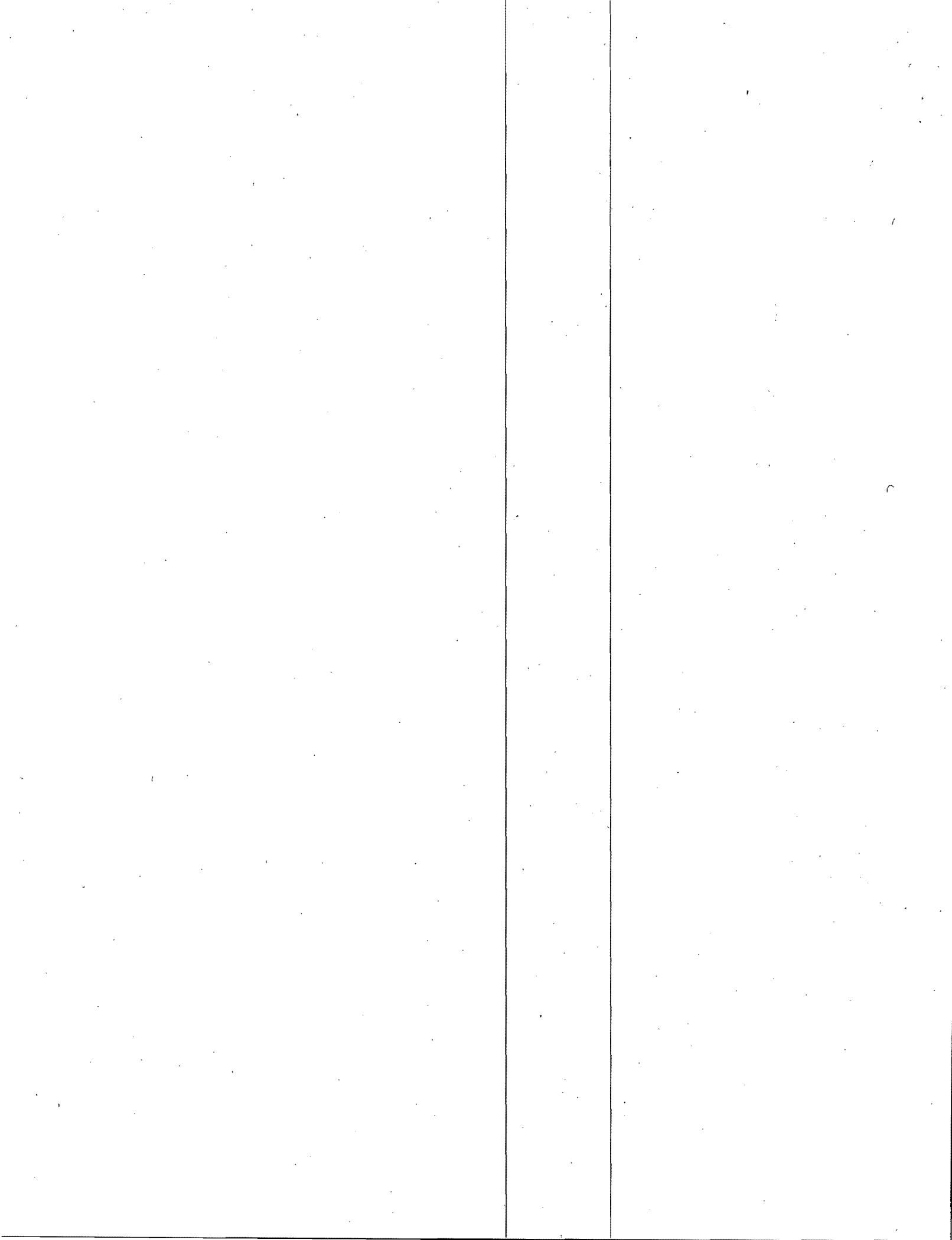
Parameter	Extracted	Extract Vol	Date	Analyst	Method
EPH	920. mL	1.00 mL	7/31/99	M. Cauthen	3510

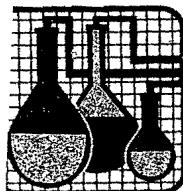
Surrogate	% Recovery	Target Range
surr-a-Terphenyl CTEX/GRI Surr., a,a,a-trifluorotoluene	120. 93.	50. - 150. 50. - 150.

Report Approved By: Theodore J. Duello Report Date: 8/ 9/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lage, Technical Services

Laboratory Certification Number: 02008





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PROJECT QUALITY CONTROL DATA

Matrix Spike Recovery

Analyte	units	Orig. Val.	MS Val	Spike Conc	Recovery	Target Range	Q.C. Batch
Gasoline Range Organics	ng/l	< 0.10	0.22	0.22	100	69. - 127.	1122
Ext Petroleum Hyd. (EPH)	ng/l	< 0.10	5.20	5.00	104	56. - 126.	5707
Sulfate	ng/l	61.0	69.6	15.0	57	47. - 139.	6541

Matrix Spike Duplicate

Analyte	units	Orig. Val.	Duplicate	RPD	Limit	Q.C. Batch
Gasoline Range Organics	ng/l	0.22	0.21	4.65	20.	1122
Ext Petroleum Hyd. (EPH)	ng/l	5.20	4.73	8.42	29.	5707
Sulfate	ng/l	69.6	69.6	0.00	4.	6541

Laboratory Control Data

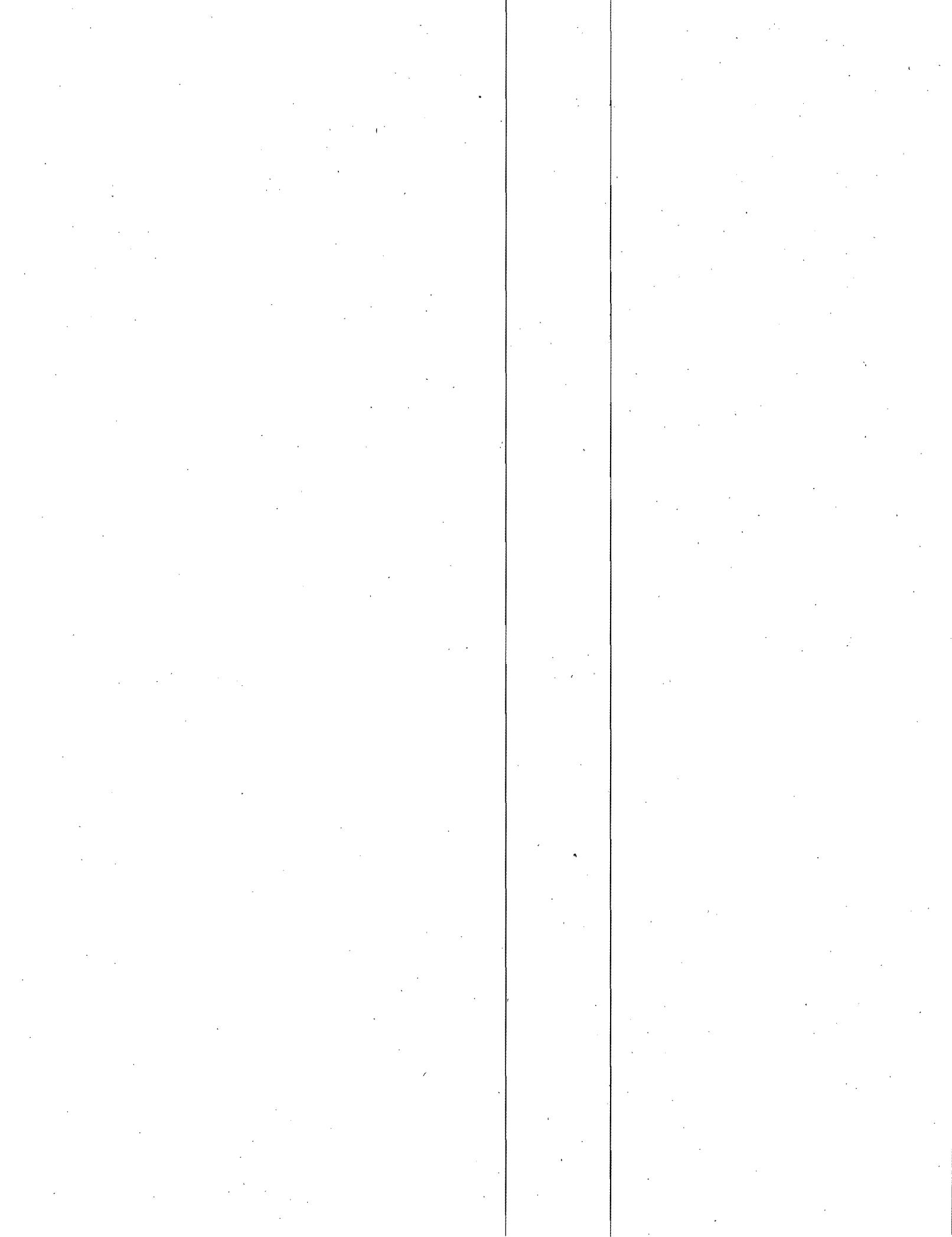
Analyte	units	Known Val.	Analyzed Val	% Recovery	Target Range	Q.C. Batch
Gasoline Range Organics	ng/l	0.22	0.21	95	60 - 140	1122
Ext Petroleum Hyd. (EPH)	ng/l	5.00	4.85	97	60 - 140	5707
Sulfate	ng/l	150.	148.	99	80 - 120	6541
Biochemical Oxygen Demand	mg/l	198.	181.	91	80 - 120	4907

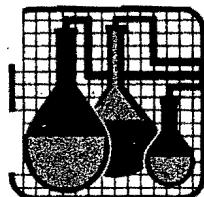
Duplicates

Analyte	units	Orig. Val.	Duplicate	RPD	Limit	Q.C. Batch
Biochemical Oxygen Demand	mg/l	< 6.0	< 6.0	N/A	15.	4907
Biochemical Oxygen Demand	mg/l	< 6.0	< 6.0	N/A	15.	4907

Blank Data

Analyte	Blank Value	Units	Q.C. Batch
Gasoline Range Organics	< 0.10	ng/l	1122
Ext Petroleum Hyd. (EPH)	< 0.10	ng/l	5707
Sulfate	< 5.00	ng/l	6541
Sulfate	< 5.00	ng/l	6541





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ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A135941
Sample ID: WIL 827 RW COMB
Sample Type: Water
Site ID: NOT GIVEN

Project:
Project Name: AUG-MONTHLY
Sampler: J. YEAGER

Date Collected: 8/31/99
Time Collected:
Date Received: 9/ 2/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
---------	--------	-------	--------------	------------	------------	------	------	---------	--------	-------

ORGANIC PARAMETERS

Ext Petroleum Hyd. (EPH) 0.79 mg/l 0.11 0.10 1 9/ 7/99 18:56 J.Saiyasak TDHE 8864

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Extracted	Extract Vol	Date	Analyst	Method
EPH	925. ml	1.00 ml	9/ 6/99	K.Phelps	3510

Surrogate	% Recovery	Target Range
surr-o-Terphenyl	120.	50. - 150.

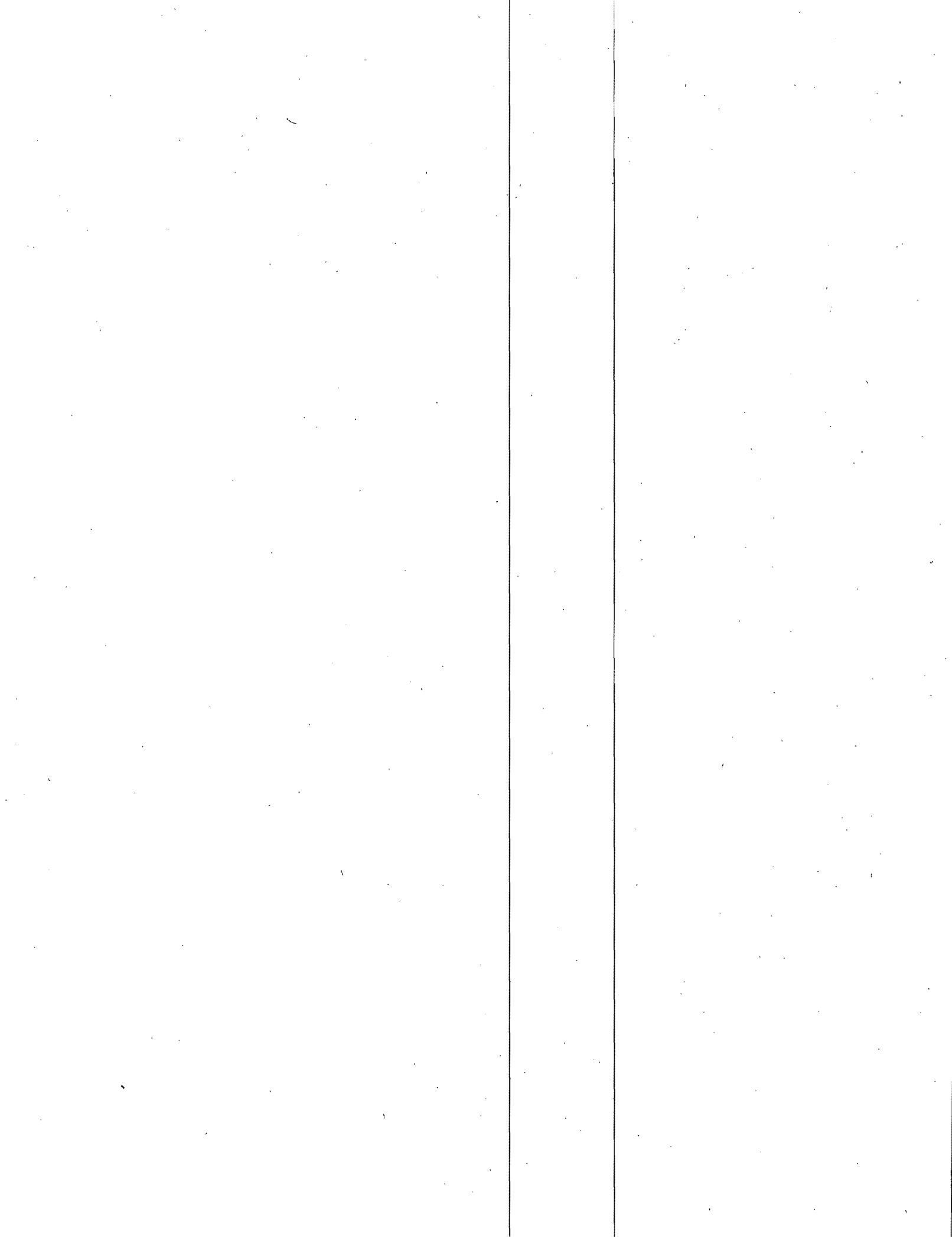
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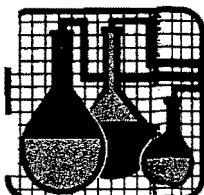
Report Approved By:

Report Date: 9/20/99

Theodore J. Duollo, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lage, Technical Services

Laboratory Certification Number: 02008





SPECIALIZED ASSAYS, INC.

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ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A135942
Sample ID: WIL 828 RW-12
Sample Type: Water
Site ID: NOT GIVEN

Project:
Project Name: AUG-MONTHLY
Sampler: J. YEAGER

Date Collected: 8/31/99
Time Collected:
Date Received: 9/ 2/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan. Limit	Dil Factor	Date	Time	Analyst	Method	Batch
ORGANIC PARAMETERS										
Ext Petroleum Hyd. (EPH)	36.9	mg/l	10.8	0.10	100	9/ 8/99	8:37	J.Saiyasak	TDME	8864

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Extracted	Extract Vol	Date	Analyst	Method
EPH	930. ml	1.00 ml	9/ 8/99	K.Phelps	3510

TEPH surrogate was diluted out due to sample matrix

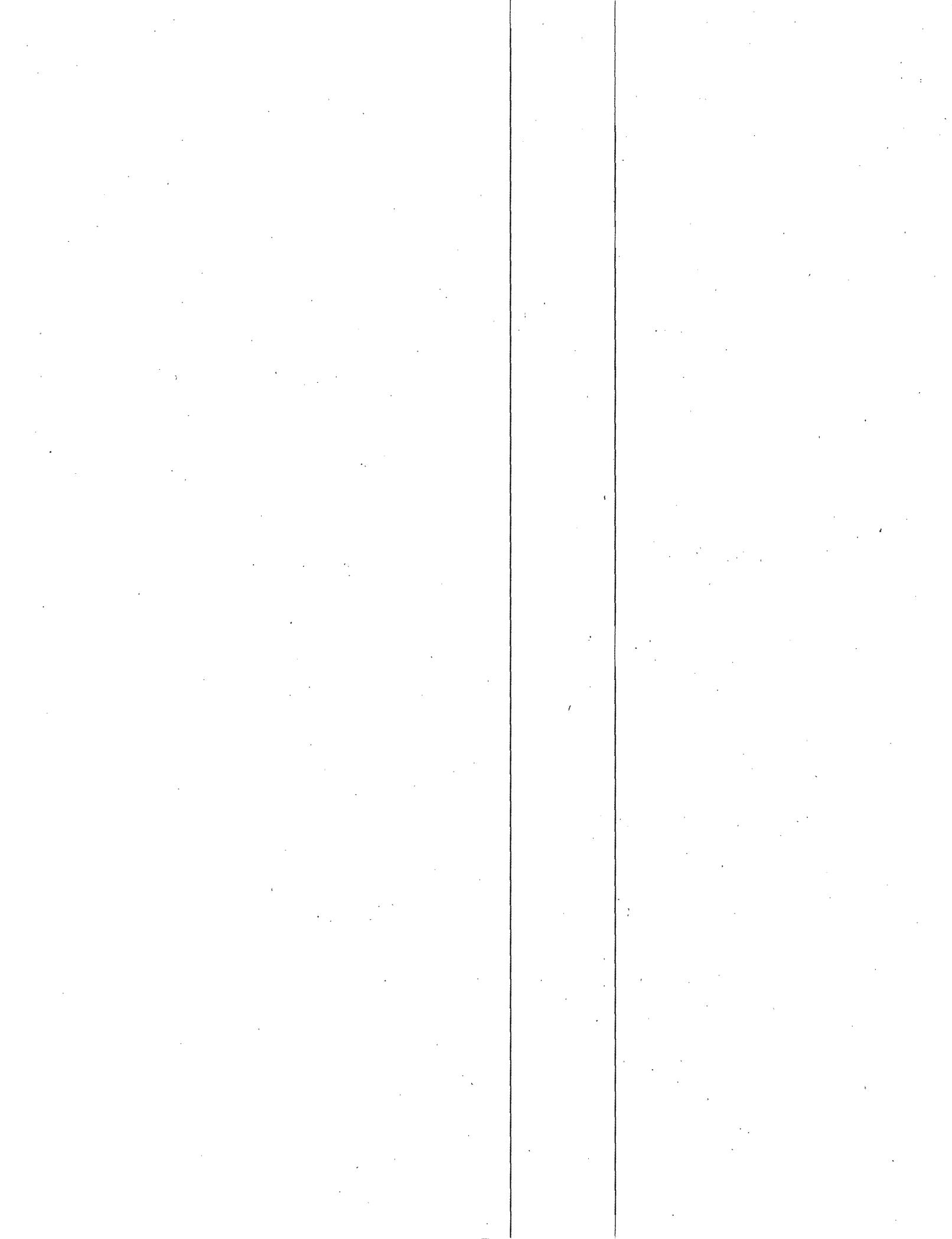
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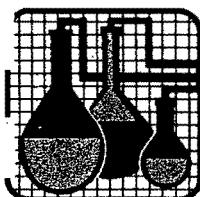
Report Approved By:

Report Date: 9/20/99

Theodore J. Duollo, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lage, Technical Services

Laboratory Certification Number: 02008





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PROJECT QUALITY CONTROL DATA

Matrix Spike Recovery

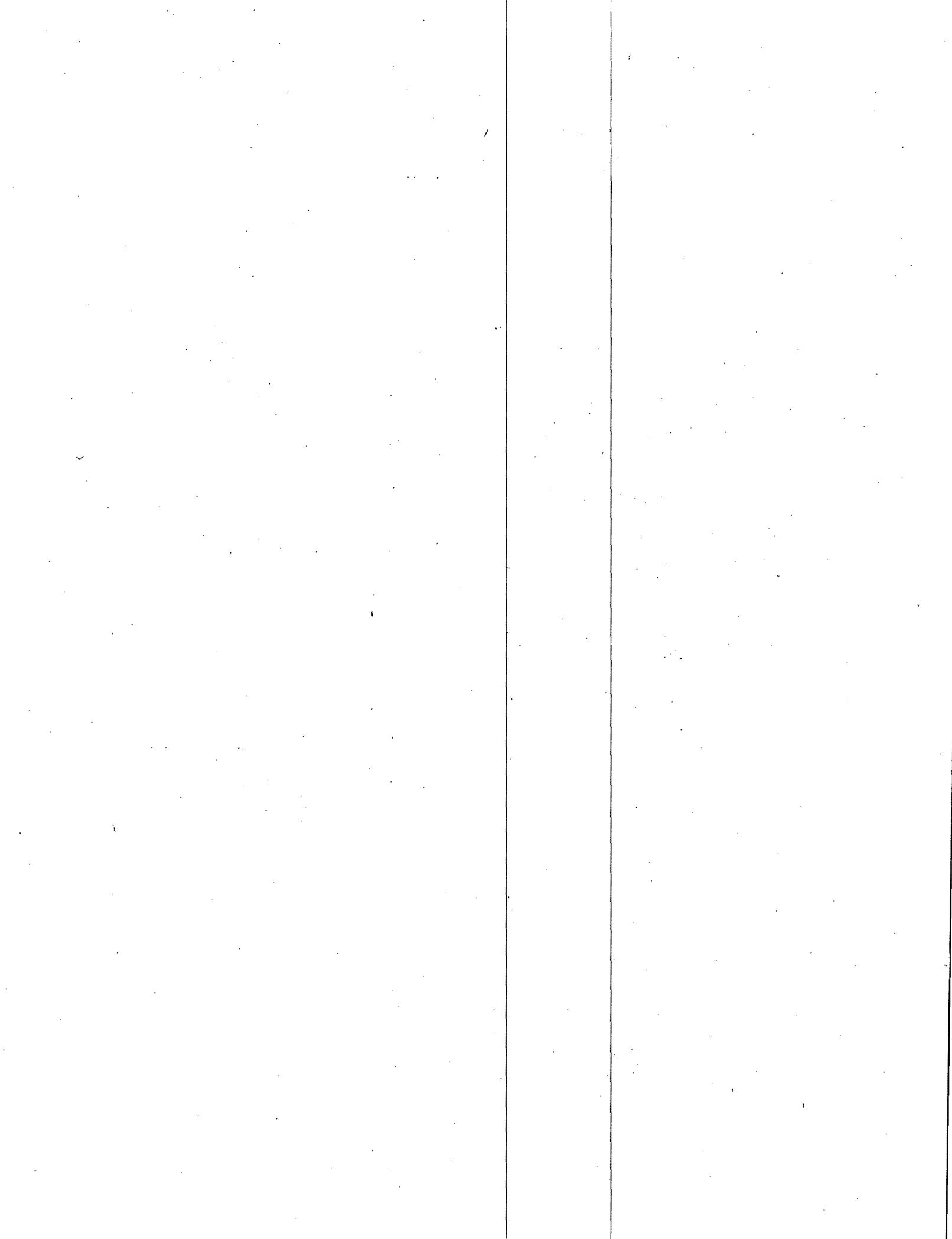
Analyte	units	Orig. Val.	MS Val	Spike Conc	Recovery	Target Range	Q.C. Batch
Benzene	ng/kg	< 0.10	0.24	0.25	96	74. - 125.	8586
Ext Petroleum Hyd. (EPH)	ng/l	< 0.10	3.87	5.00	77	56. - 126.	8864
Nitrate-N as N	mg/kg	< 1.00	23.0	25.0	92	69. - 123.	275
Arsenic	ng/kg	1.793	19.361	20.000	88	80 - 120	8845
Barium	ng/kg	95.418	433.134	400.000	84	80 - 120	8845
Cadmium	ng/kg	< 0.996	17.365	20.000	87	80 - 120	8845
Chromium	ng/kg	5.378	40.319	40.000	87	80 - 120	8845
Copper	ng/kg	1.793	46.707	50.000	90	80 - 120	8845
Lead	ng/kg	3.586	89.022	100.000	85	80 - 120	8845
Mercury	ng/kg	< 0.100	0.150	0.170	88	80 - 120	8390
Nickel	ng/kg	3.785	86.028	100.000	82	80 - 120	8845
Selenium	ng/kg	0.996	18.962	20.000	90	80 - 120	8845
Silver	ng/kg	< 0.996	7.784	10.000	78	80 - 120	8845
Zinc	ng/kg	47.211	129.541	100.000	82	80 - 120	8845

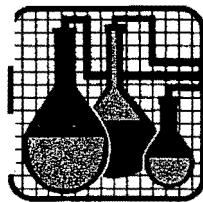
Matrix Spike Duplicate

Analyte	units	Orig. Val.	Duplicate	RPD	Limit	Q.C. Batch
Benzene	ng/kg	0.24	0.24	0.00	19.	8586
Ext Petroleum Hyd. (EPH)	ng/l	3.87	3.23	18.03	29.	8864
Nitrate-N as N	mg/kg	23.0	22.0	4.44%	3.	275
Arsenic	ng/kg	19.361	19.002	1.87	20	8845
Barium	ng/kg	433.134	426.104	1.64	20	8845
Cadmium	ng/kg	17.365	17.274	0.53	20	8845
Chromium	ng/kg	40.319	39.923	0.99	20	8845
Copper	ng/kg	46.707	46.257	0.97	20	8845
Lead	ng/kg	89.022	89.060	0.04	20	8845
Mercury	ng/kg	0.150	0.155	3.28	20	8390
Nickel	ng/kg	86.028	85.988	0.05	20	8845
Potassium	ng/kg	4770.46	4510.56	5.60	20	8845
Selenium	ng/kg	18.962	18.042	4.97	20	8845
Silver	ng/kg	7.784	8.061	3.50	20	8845
Zinc	ng/kg	129.541	125.720	2.99	20	8845

Laboratory Control Data

Analyte	units	Known Val.	Analyzed Val	% Recovery	Target Range	Q.C. Batch
Benzene	ng/kg	0.25	0.25	100	70 - 130	8586
Ext Petroleum Hyd. (EPH)	ng/l	5.00	3.46	69	60 - 140	8864
Arsenic	ng/kg	37.000	40.000	103	80 - 120	8845
Barium	ng/kg	112.000	115.000	103	80 - 120	8845
Cadmium	ng/kg	35.000	33.000	94	80 - 120	8845
Chromium	ng/kg	108.000	99.000	92	80 - 120	8845
Copper	ng/kg	62.000	64.000	103	80 - 120	8845





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ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A150136
Sample ID: RW COMB WIL 83
Sample Type: Water
Site ID:

Project:
Project Name: MTH-SEPT.
Sampler: E. BRANSON/J. YEAGER

Date Collected: 9/30/99
Time Collected:
Date Received: 10/ 1/99
Time Received: 9:00

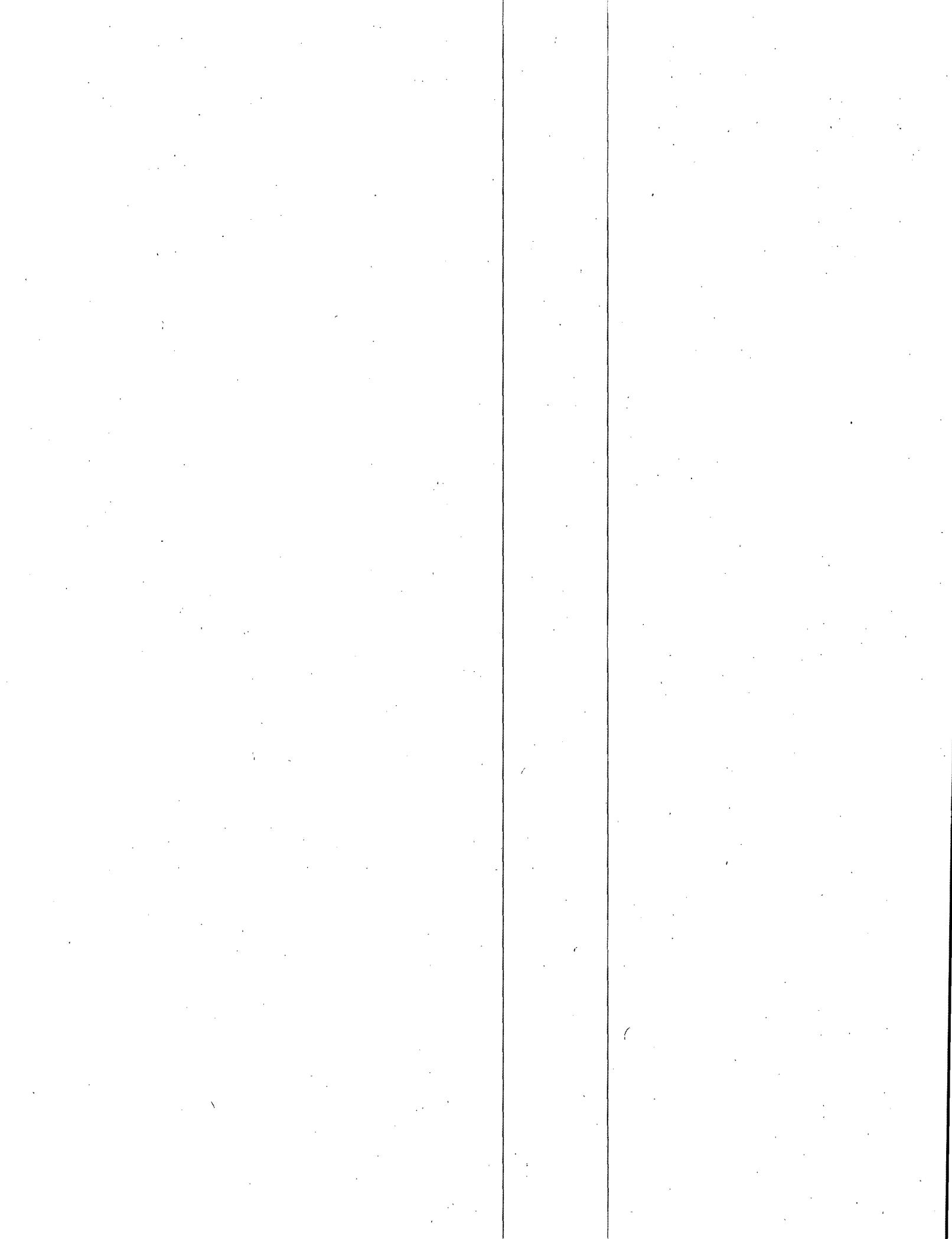
Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
ORGANIC PARAMETERS										
Gasoline Range Organics	0.45	ng/l	5.00	0.10	50	10/ 6/99	5:20	T. Johnson	TDHE	6981
Ext Petroleum Hyd. (EPH)	0.34	ng/l	0.10	0.10	1	10/ 7/99	4:27	J. Salyasak	TDHE	6687

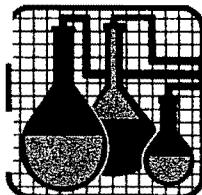
ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol	Extracted	Extract Vol	Date	Analyst	Method
EPH	990. ml	1.00 ml		10/ 5/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
surr-o-Terphenyl	78.	50. - 150.
BTEX/GRO Surr., a,a,a-trifluorotoluene	99.	50. - 150.





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ANALYTICAL REPORT

Laboratory Number: 99-A150136
Sample ID: RW COMB WIL 83

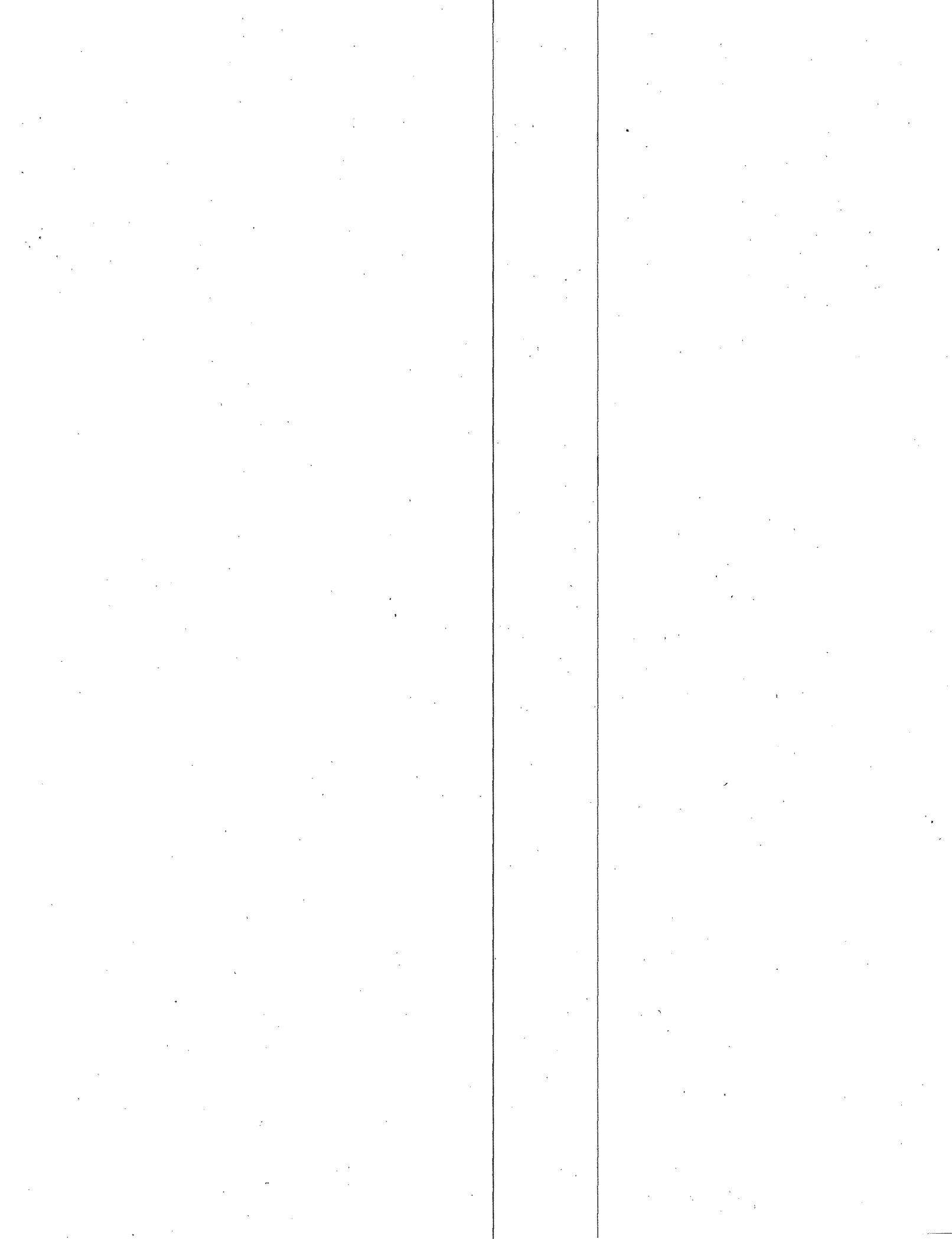
Page 2

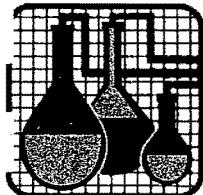
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Report Approved By: Gail A Lage Report Date: 10/ 8/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lage, Technical Services

Laboratory Certification Number: 02008





SPECIALIZED ASSAYS, INC.

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Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A150137
Sample ID: RW-12 COMB WIL 833
Sample Type: Water
Site ID:

Project:
Project Name: MTH-SEPT.
Sampler: E. BRANSON/J. YEAGER

Date Collected: 9/30/99
Time Collected:
Date Received: 10/ 1/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
INORGANIC PARAMETERS										
Gasoline Range Organics	117.	ng/l	10.0	0.10	100	10/ 6/99	8:30	T. Johnson	TDHE	6981
Ext Petroleum Hyd. (EPH)	35.7	ng/l	5.15	0.10	50	10/ 7/99	10:49	J. Saigasak	TDHE	6687

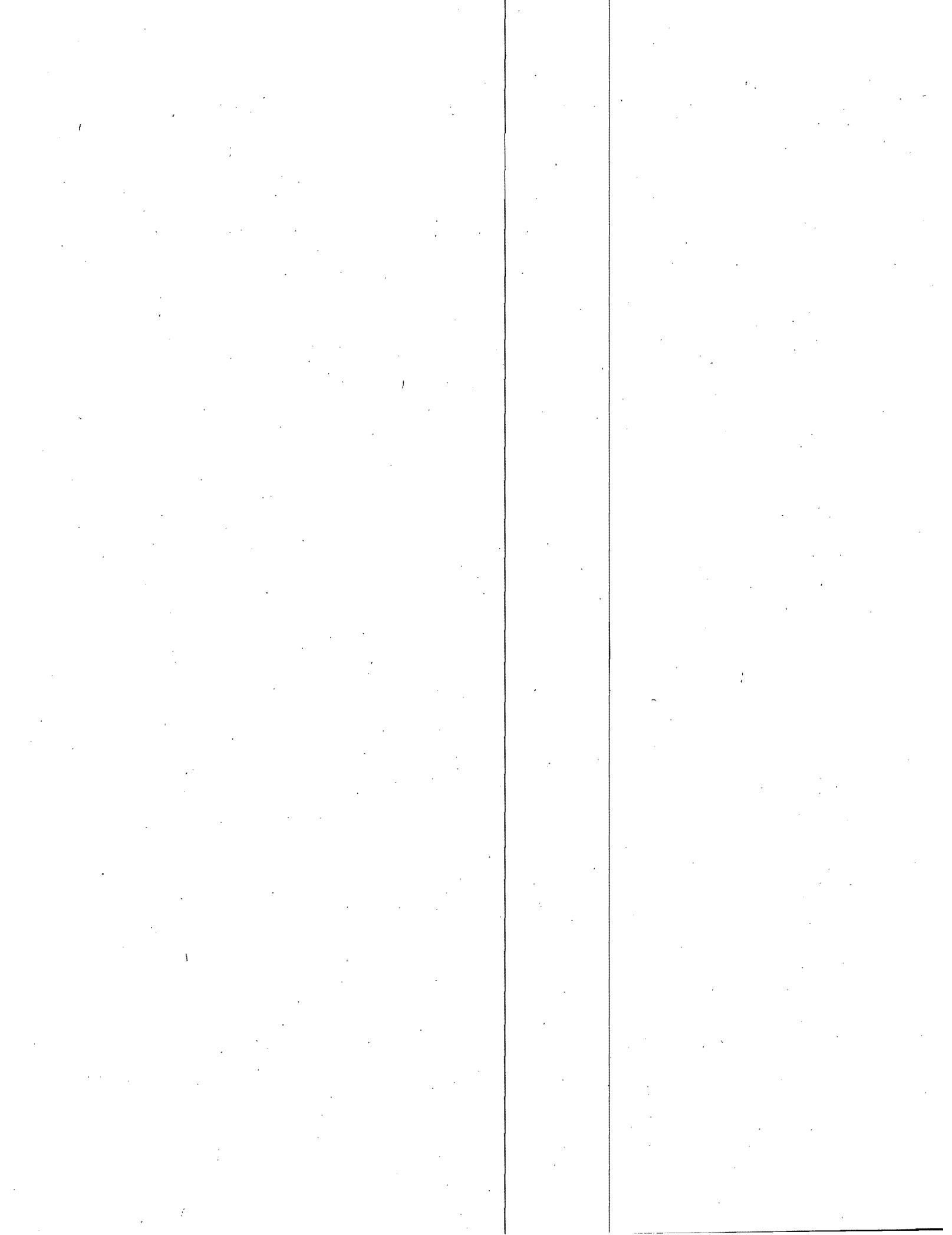
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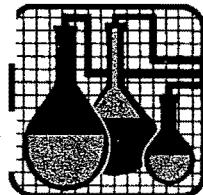
Sample Extraction Data

Parameter	Extracted	Extract Vol	Date	Analyst	Method
EPH	970. ml	1.00 ml	10/ 5/99	Fitzwater	3510

Surrogate	% Recovery	Target Range
BTEX/GRO Surr., α,α,α -trifluorotoluene	83.	50. - 150.

TEPH surrogate was diluted out due to sample matrix.





SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

Laboratory Number: 99-A150137
Sample ID: RW-12 COMB WIL 833

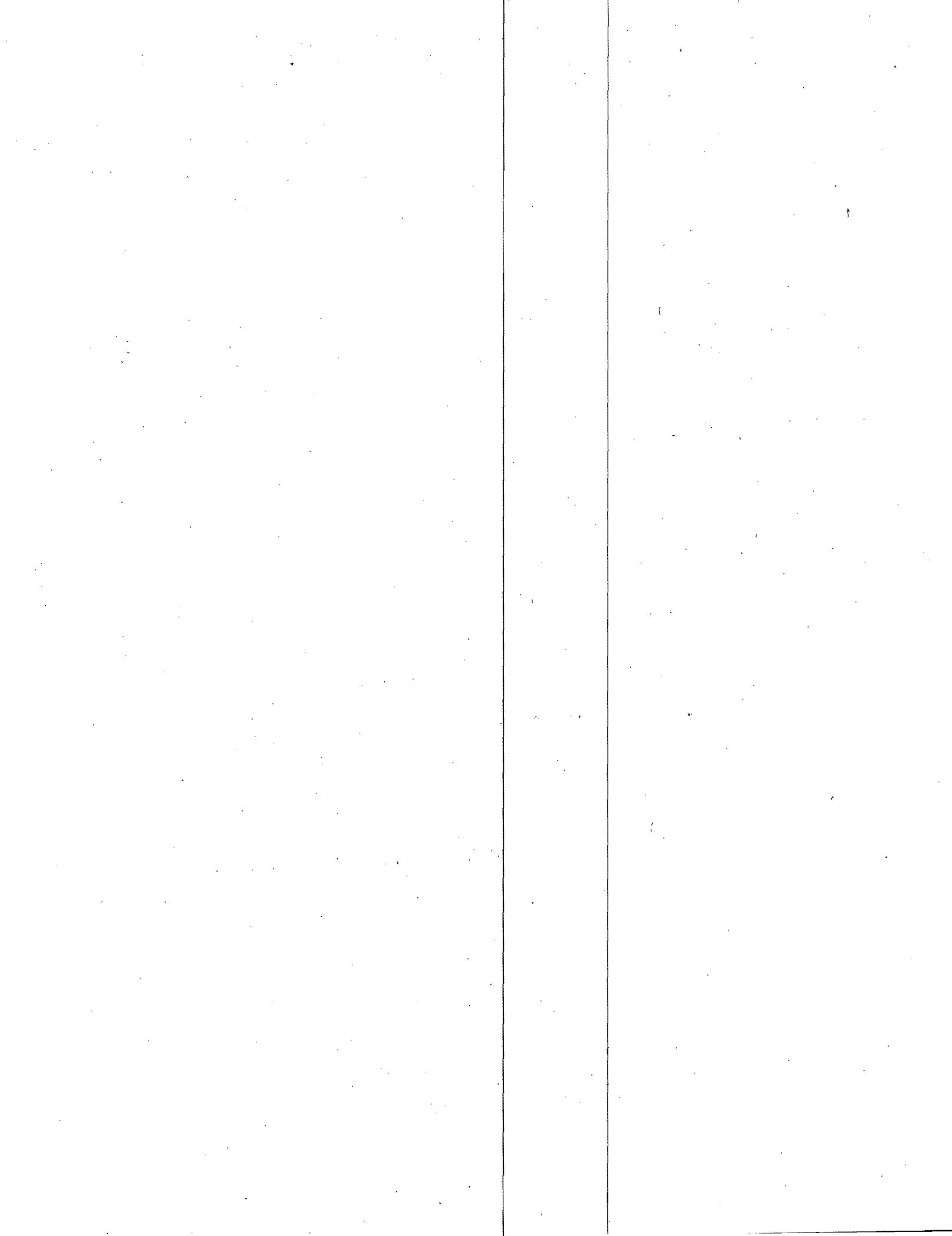
Page 2

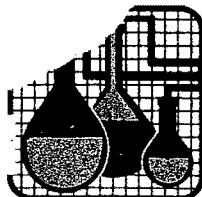
These results relate only to the items tested.
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Report Approved By: Gail A Lage Report Date: 10/ 8/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lage, Technical Services

Laboratory Certification Number: 02008





SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

PROJECT QUALITY CONTROL DATA

Matrix Spike Recovery

Analyte	units	Orig. Val.	MS Val	Spike Conc	Recovery	Target Range	R.C. Batch
Gasoline Range Organics	ng/l	< 0.10	0.24	0.22	109	69 - 127.	6981
Ext Petroleum Hyd. (EPH)	ng/l	0.11	1.00	1.00	89	36. - 126.	6687

Matrix Spike Duplicate

Analyte	units	Orig. Val.	Duplicate	RPD	Limit	R.C. Batch
Gasoline Range Organics	ng/l	0.24	0.23	4.26	20.	6981
Ext Petroleum Hyd. (EPH)	ng/l	1.00	0.74	29.89	29.	6687

Laboratory Control Data

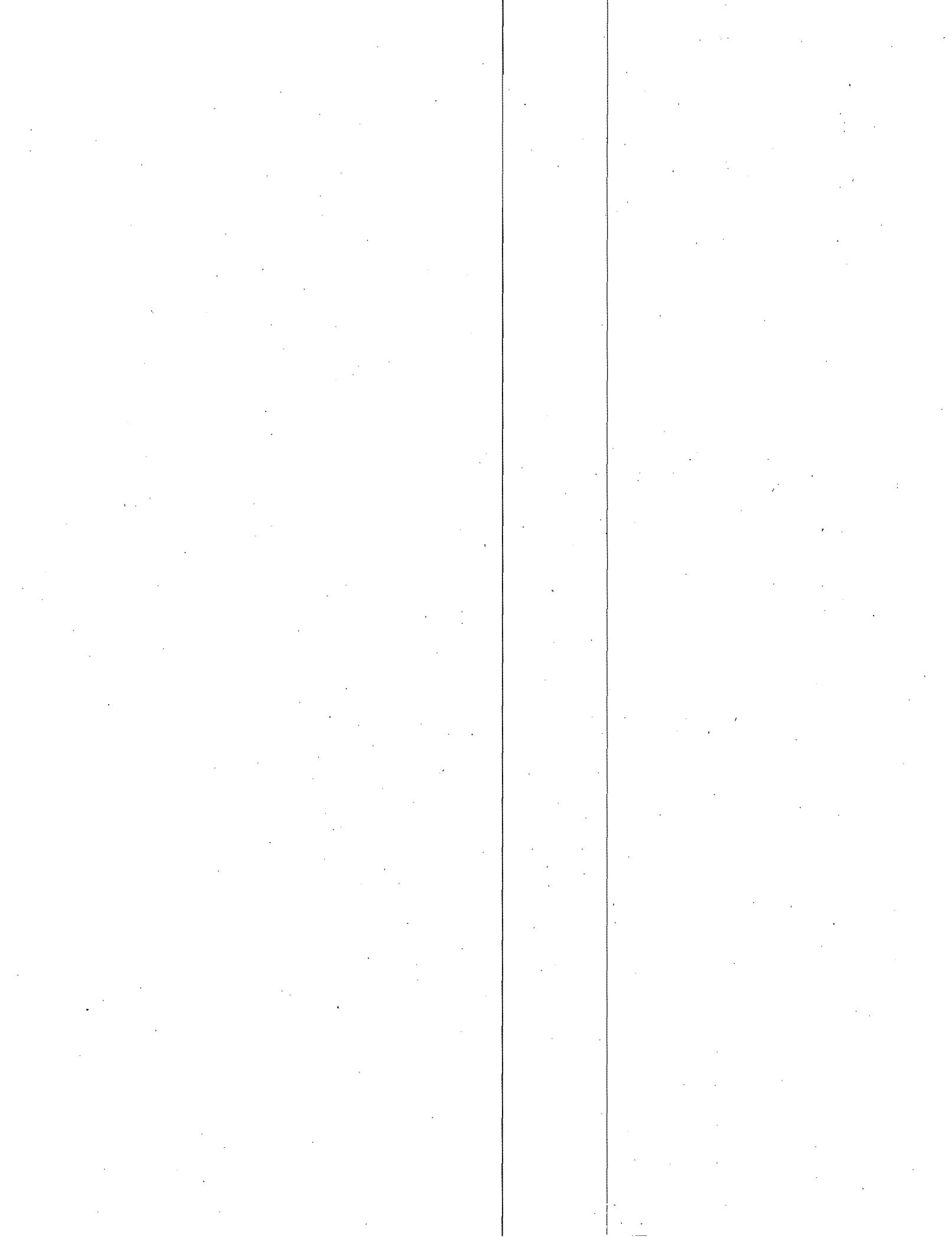
Analyte	units	Known Val.	Analyzed Val	% Recovery	Target Range	R.C. Batch
Gasoline Range Organics	ng/l	0.22	0.24	109	60 - 140	6981
Ext Petroleum Hyd. (EPH)	ng/l	1.00	0.74	74	60 - 140	6687
Sulfate	ng/l	150.	145.	97	80 - 120	5849
Biochemical Oxygen Demand	ng/l	198.	180.	91	80 - 120	3808
Biochemical Oxygen Demand	mg/l	198.	227.	115	80 - 120	3808

Duplicates

Analyte	units	Orig. Val.	Duplicate	RPD	Limit	R.C. Batch
Biochemical Oxygen Demand	mg/l	198.	222.	11.43	15.	3808
Biochemical Oxygen Demand	mg/l	94.4	98.2	3.95	15.	3808

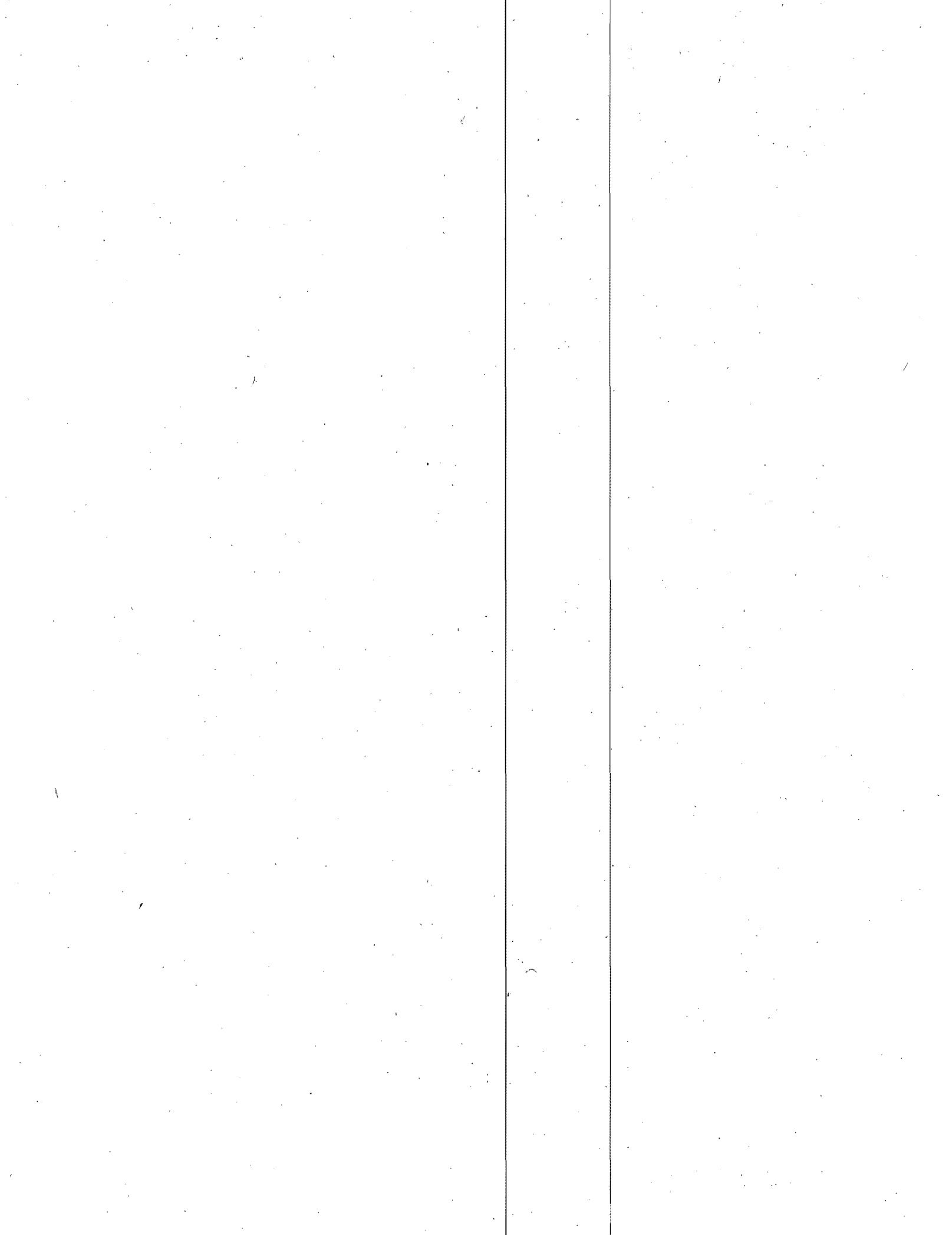
Blank Data

Analyte	Blank Value	Units	R.C. Batch
Gasoline Range Organics	< 0.10	ng/l	6981
Ext Petroleum Hyd. (EPH)	0.11	ng/l	6687
Sulfate	< 5.00	ng/l	5849



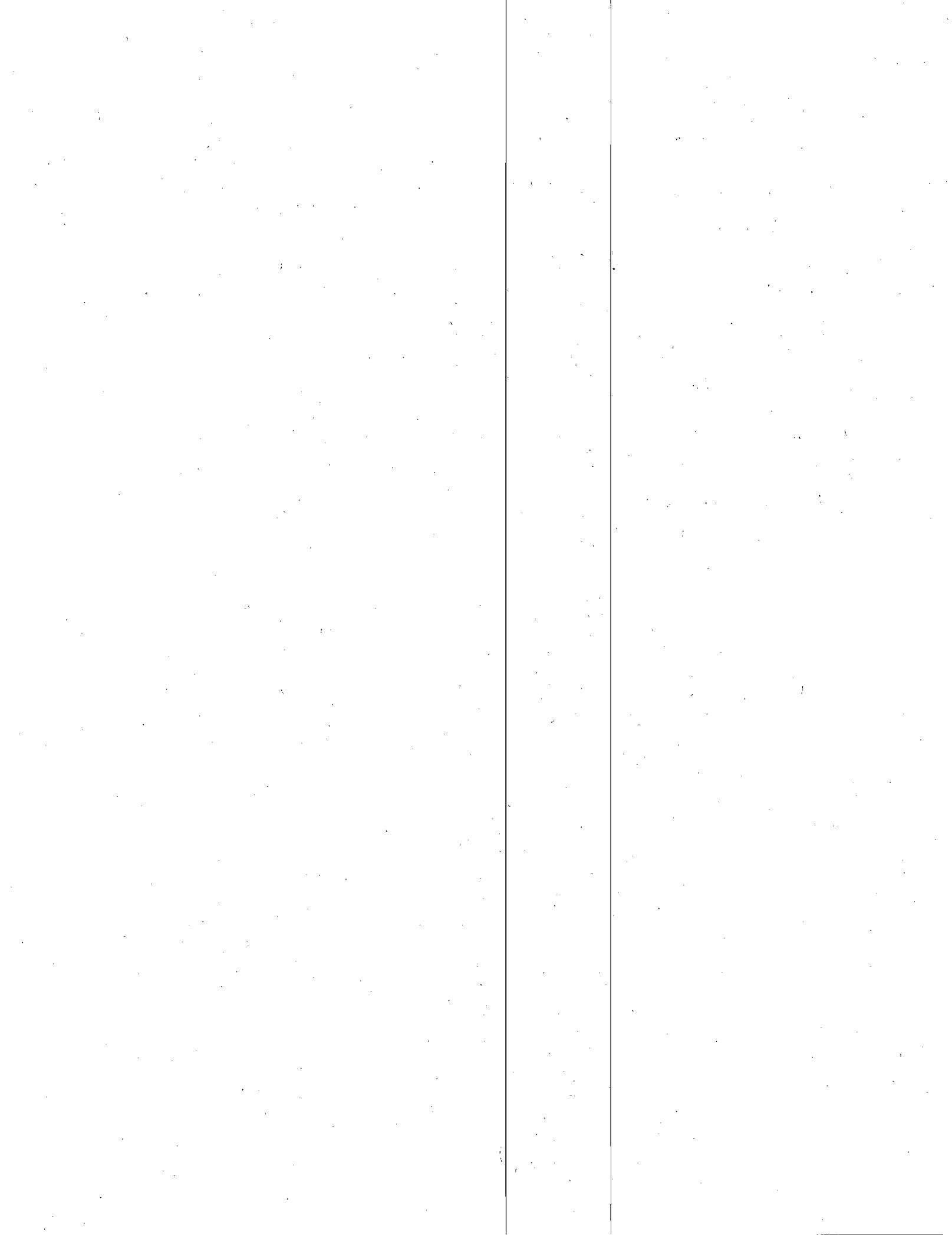
APPENDIX

B



APPENDIX B

CALCULATIONS FOR MASS OF CONSTITUENTS REMOVED AND FOR APPARENT FREE PRODUCT VOLUME



APPENDIX B

CALCULATION OF WEIGHT OF CONSTITUENTS REMOVED

Williams Refining, L.L.C.
543 West Mallory Avenue
Memphis, Tennessee
TDEC FID No. 9-791214

A. Calculations for the combined flow of RW-1 through RW-11

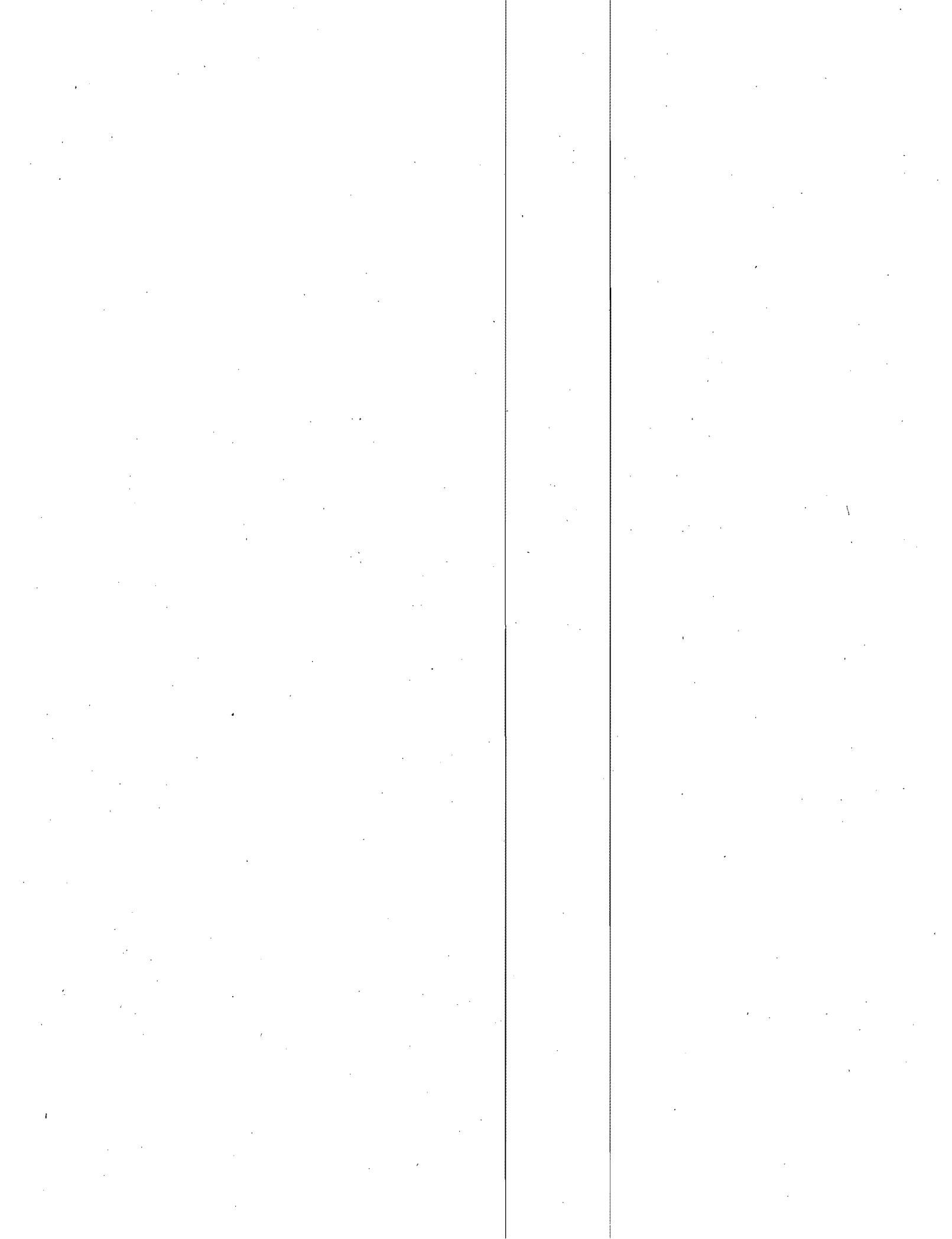
Date	Total Gallons Pumped to Date	Gallons Pumped by Month
April-99	129,054,173	506,000
May-99	131,322,173	2,268,000
June-99	133,424,173	2,102,000
July-99	135,293,173	1,869,000
August-99	136,598,173	1,305,000
September-99	138,154,173	1,556,000
Total:		9,606,000

I. Average flow rate (April 1, 1999 - September 30, 1999)

$$\frac{9,606,000}{183} \frac{\text{gal}}{\text{days}} \times \frac{1}{1440} \frac{\text{day}}{\text{min}} = 36.5 \frac{\text{gal}}{\text{min}}$$

II. Total time system down

$$\frac{12 \text{ days}}{183 \text{ days}} \times 100 = 6.6\%$$



APPENDIX B
CALCULATION OF WEIGHT OF CONSTITUENTS REMOVED

Williams Refining, L.L.C.
543 West Mallory Avenue
Memphis, Tennessee
TDEC FID No. 9-791214

IV. Calculated quantity of benzene and Total Petroleum Hydrocarbons (TPH) removed.
Effluent is discharged to local POTW. Also included is the pounds removed.

(a) Benzene removed

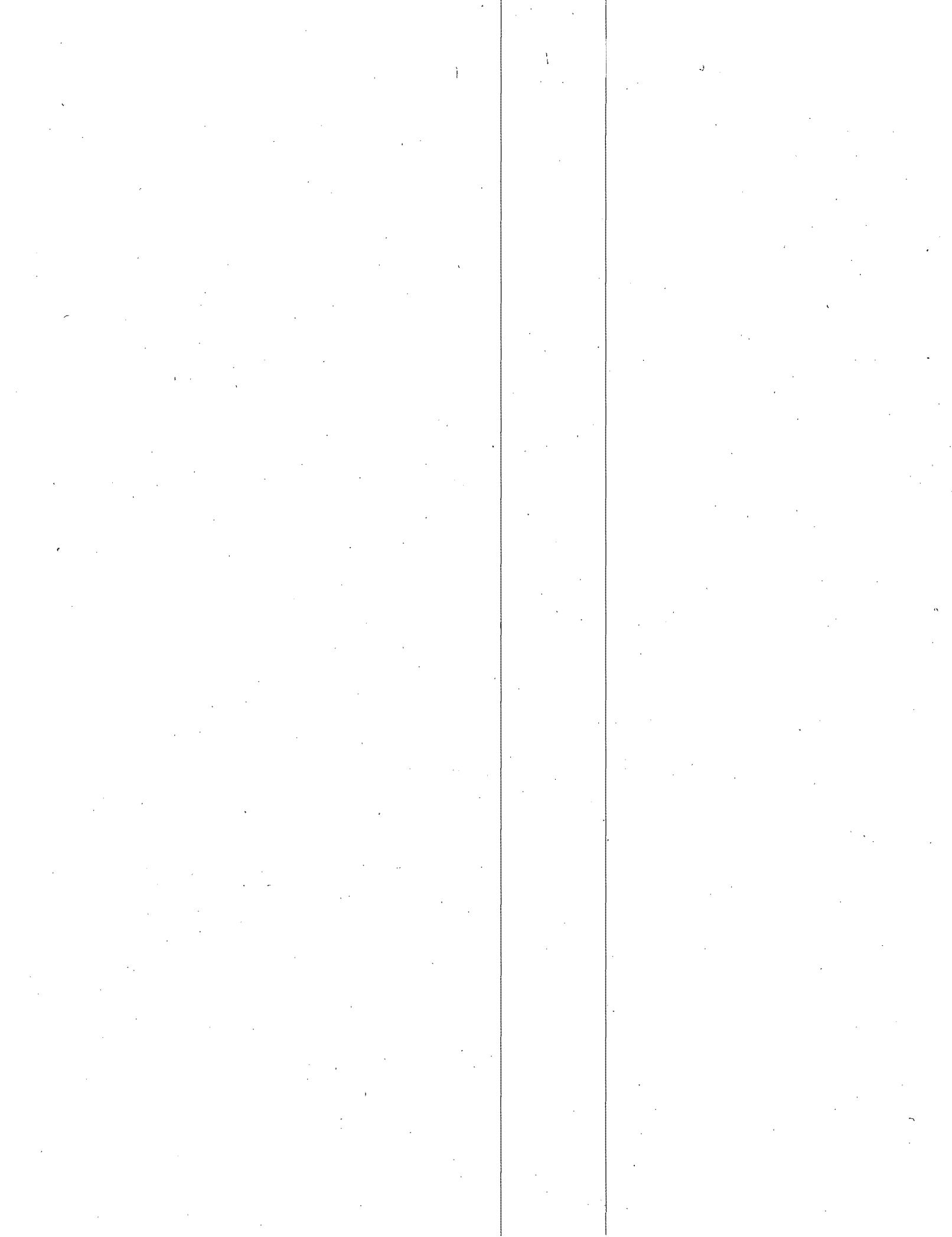
Sample Period	Gallons Pumped	Benzene Concentration During Period (mg/L)	Notes	Conversion lbs L / mg gal	Pounds Removed
April-99	506,000	12.48	1	8.335E-06	52.63
May-99	2,268,000	11.66		8.335E-06	220.42
June-99	2,102,000	12.67		8.335E-06	221.98
July-99	1,869,000	10.01	2	8.335E-06	155.86
August-99	1,305,000	7.34		8.335E-06	79.84
September-99	1,556,000	8.55	3	8.335E-06	110.82
Total:					841.55

- 1] Sampled on 04/08 & 04/15/99. Concentration presented is the average between both events
- 2] Not sampled in July 1999. Concentration presented is the average between the June & August events
- 3] Sampled on 09/01 & 09/30/99. Concentration presented is the average between both events

(b) TPH removed (gasoline range organics [GRO] and extractable petroleum hydrocarbons [EPH])

Sample Period	Gallons Pumped	TPH Concentration During Period (mg/L)	Note	Conversion lbs L / mg gal	Pounds Removed
April-99	506,000	33.88		8.335E-06	142.89
May-99	2,268,000	15.31		8.335E-06	289.42
June-99	2,102,000	43.44		8.335E-06	761.08
July-99	1,869,000	16.43		8.335E-06	255.95
August-99	1,305,000	0.79	1	8.335E-06	8.59
September-99	1,556,000	9.29		8.335E-06	120.48
Total:					1,578.41

- 1] Concentration represents EPH, only. Sample aliquot collected for GRO analysis was lost during shipping.



APPENDIX B
CALCULATION OF WEIGHT OF CONSTITUENTS REMOVED

Williams Refining, L.L.C.
543 West Mallory Avenue
Memphis, Tennessee
TDEC FID No. 9-791214

B. Calculations for RW-12

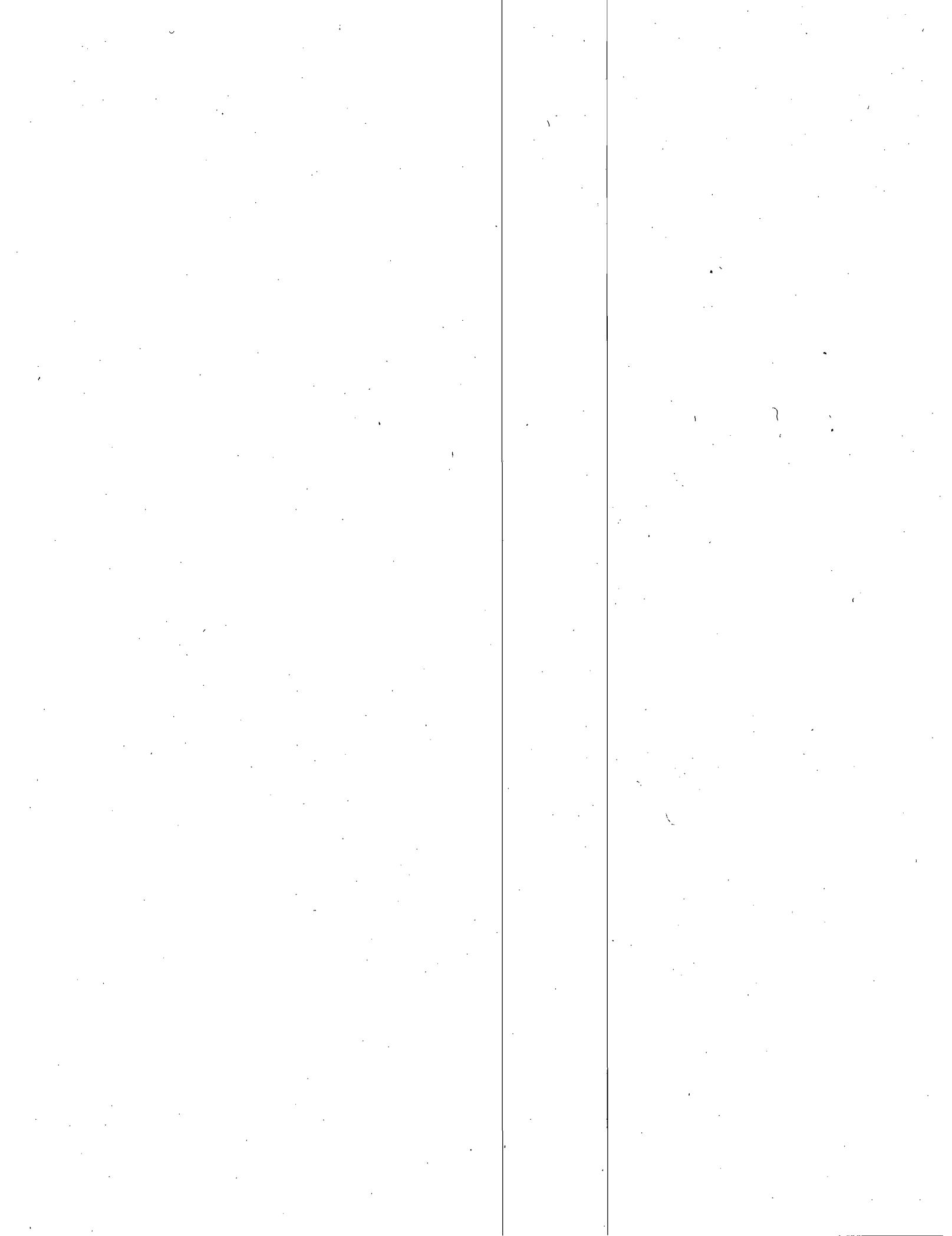
Date	Total Gallons Pumped to Date	Gallons Pumped by Month
April-99	1,392,362	86,478
May-99	1,485,537	93,175
June-99	1,565,079	79,543
July-99	1,655,956	90,876
August-99	1,767,452	111,496
September-99	1,870,906	103,454
Total:		565,022

I. Average flow rate (April 1, 1999 - September 30, 1999)

$$\frac{565,022}{183} \frac{\text{gal}}{\text{days}} \times \frac{1}{1440} \frac{\text{day}}{\text{min}} = 2.1 \frac{\text{gal}}{\text{min}}$$

II. Total time system down

$$\frac{6 \text{ days}}{183 \text{ days}} \times 100 = 3.3\%$$



APPENDIX B
CALCULATION OF WEIGHT OF CONSTITUENTS REMOVED

Williams Refining, L.L.C.
543 West Mallory Avenue
Memphis, Tennessee
TDEC FID No. 9-791214

IV. Calculated quantity of benzene and Total Petroleum Hydrocarbons (TPH) removed.
Effluent is discharged to local POTW. Also included is the pounds removed.

(a) Benzene removed

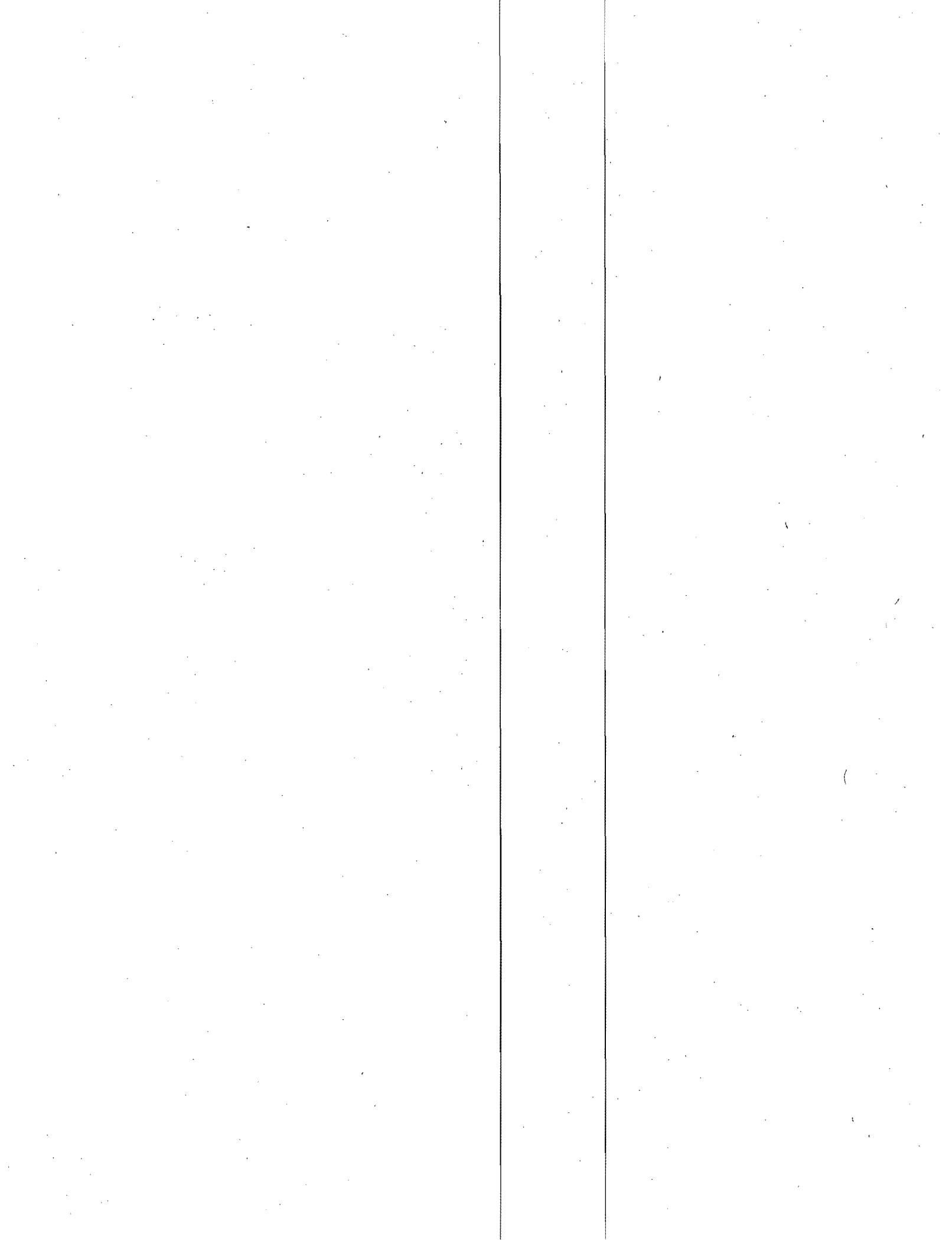
Sample Period	Gallons Pumped	Benzene Concentration During Period (mg/L)	Notes	Conversion lbs L / mg gal	Pounds Removed
April-99	86,478	1.23	1	8.335E-06	0.88
May-99	93,175	1.81		8.335E-06	1.41
June-99	79,543	3.51		8.335E-06	2.33
July-99	90,876	2.26	2	8.335E-06	1.71
August-99	111,496	1.01		8.335E-06	0.94
September-99	103,454	8.62	3	8.335E-06	7.43
Total:					14.70

- 1] Sampled on 04/08 & 04/15/99. Concentration presented is the average between both events
- 2] Not sampled in July 1999. Concentration presented is the average between the June & August events
- 3] Sampled on 09/01 & 09/30/99. Concentration presented is the average between both events

(b) TPH removed (gasoline range organics [GRO] and extractable petroleum hydrocarbons [EPH])

Sample Period	Gallons Pumped	TPH Concentration During Period (mg/L)	Note	Conversion lbs L / mg gal	Pounds Removed
April-99	86,478	5.75		8.335E-06	4.14
May-99	93,175	6.52		8.335E-06	5.06
June-99	79,543	38.40		8.335E-06	25.46
July-99	90,876	10.00		8.335E-06	7.57
August-99	111,496	36.9	1	8.335E-06	34.29
September-99	103,454	152.7		8.335E-06	131.67
Total:					208.20

- 1] Concentration represents EPH, only. Sample aliquot collected for GRO analysis was lost during shipping.



APPENDIX B

APPARENT FREE PRODUCT VOLUME CALCULATIONS

WILLIAMS REFINING, L.L.C.
543 West Mallory Avenue
Memphis, Tennessee
TDEC FID No. 9-791214

I. Purpose

To calculate the volume of free petroleum hydrocarbon in the subsurface at Williams Mid-South Refinery located at 543 West Mallory Avenue, Memphis, Tennessee

II. Calculations

The product volume calculated in Section 4.1 is based on the most recent product thicknesses (Figure 2; September 27, 1999). For comparison purposes, the product volume calculation from the previous product thicknesses (Figure 3; June 30, 1999) is also presented in Section 4.1. The contours presented in Figures 2 and 3 are to the nearest 0.1 foot.

- 1a. Area of free product plumes from September 27, 1999 (Figure 2). The plumes are named according to the well containing the greatest thickness.

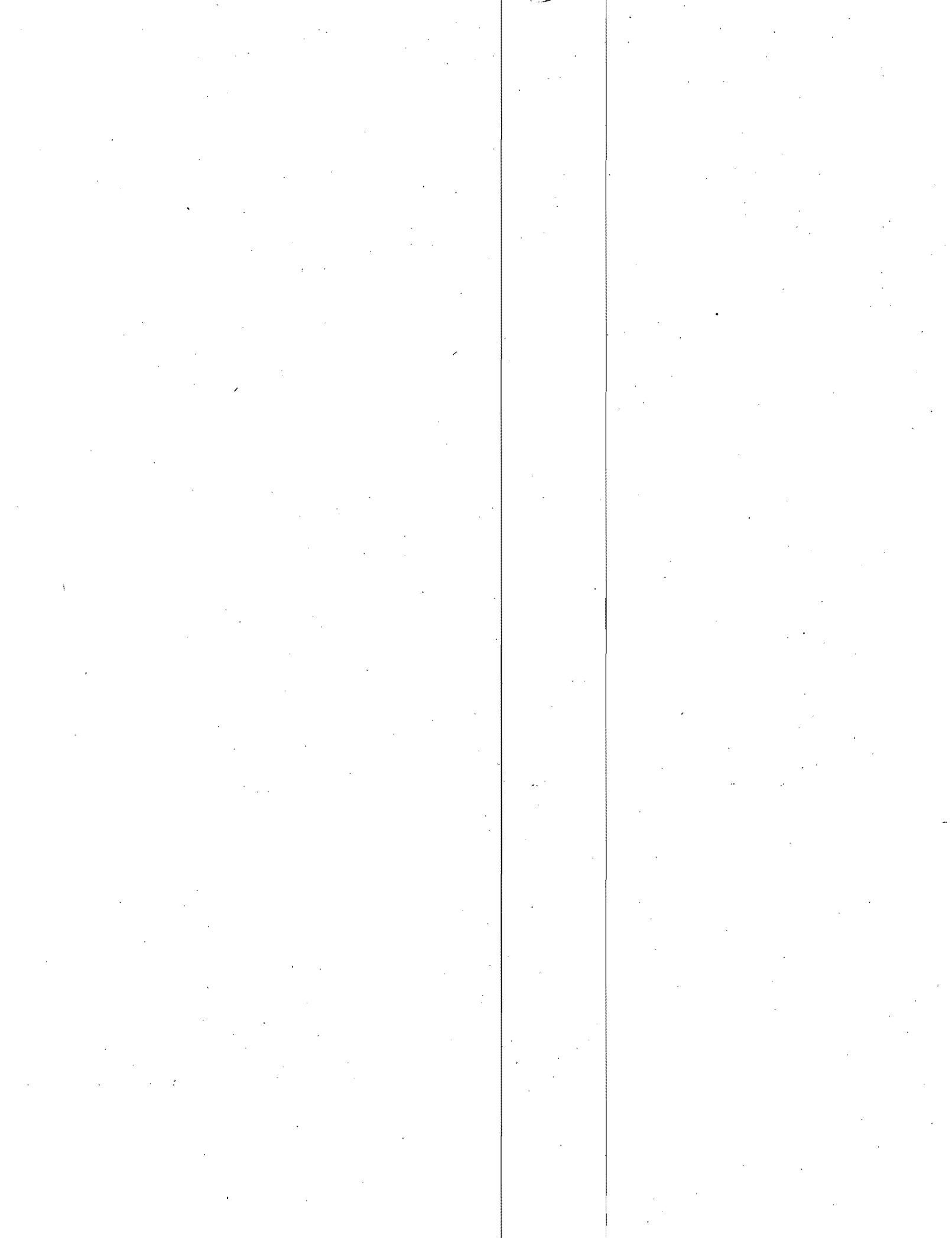
Plume Location & Contour Designation (ft)	CAD Reading (ft ³)	Horizontal Area (ft ²)
Plume OW-27		
0.1 contour	386,542	79,779
1 contour	266,659	226,556
10 contour	40,103	40,103
Plume RW-8 to G-3		
0.1 contour	849,838	780,848
G-5 1 contour	59,533	59,533
G-1 1 contour	6,089	6,089
RW-4 1 contour	3,368	3,368
Plume OW-24		
0.1 contour	37263.50	37,263
Plume OW-22/OW-23		
0.1 contour	90,834	90,834

- 1b. Volume of groundwater and soil from September 27, 1999. Like contours have been combined to simplify calculation procedures. Equal thickness has been assumed throughout each contour.

Thickness of Contour Area (ft)	Horizontal Area (ft ²)	Total Volume (ft ³)
0.1 contour 0.1 x	988,724	98,872
1.0 contour 1 x	295,546	295,546
10.0 contour 10 x	40,103	401,029

Total Volume of Groundwater & Soil (ft ³)	Porosity of Soil	Volume of Product (ft ³)
0.1 contour 98,872	30%	29,662
1.0 contour 295,546	30%	88,664
10.0 contour 401,029	30%	120,309
Total:		238,634

Conversion to gallons: 238,634 ft³ x 7.48 gal/ft³ = 1,784,984 gallons



APPENDIX B

APPARENT FREE PRODUCT VOLUME CALCULATIONS

WILLIAMS REFINING, L.L.C.
543 West Mallory Avenue
Memphis, Tennessee
TDEC FID No. 9-791214

- 2a. Area of free product plumes from June 30, 1999 (Figure 3). The plumes are named according to the well containing the greatest thickness.

Plume Location & Contour Designation (ft)	CAD Reading (ft ²)	Horizontal Area (ft ²)
Plume OW-27		
0.1 contour	487,039	127,974
1 contour	309,383	259,701
10 contour	49,682	49,682
Plume RW-8 to G-3		
0.1 contour	670,445	443,887
G-5 1 contour	85,917	85,917
B-8 1 contour	140,642	140,642
Plume OW-24		
0.1 contour	34663.37	34,663
Plume OW-22/OW-23/B-15		
0.1 contour	177,582	80,857
1 contour	96,725	96,725

- 1b. Volume of groundwater and soil from June 30, 1999. Like contours have been combined to simplify calculation procedures. Equal thickness has been assumed throughout each contour.

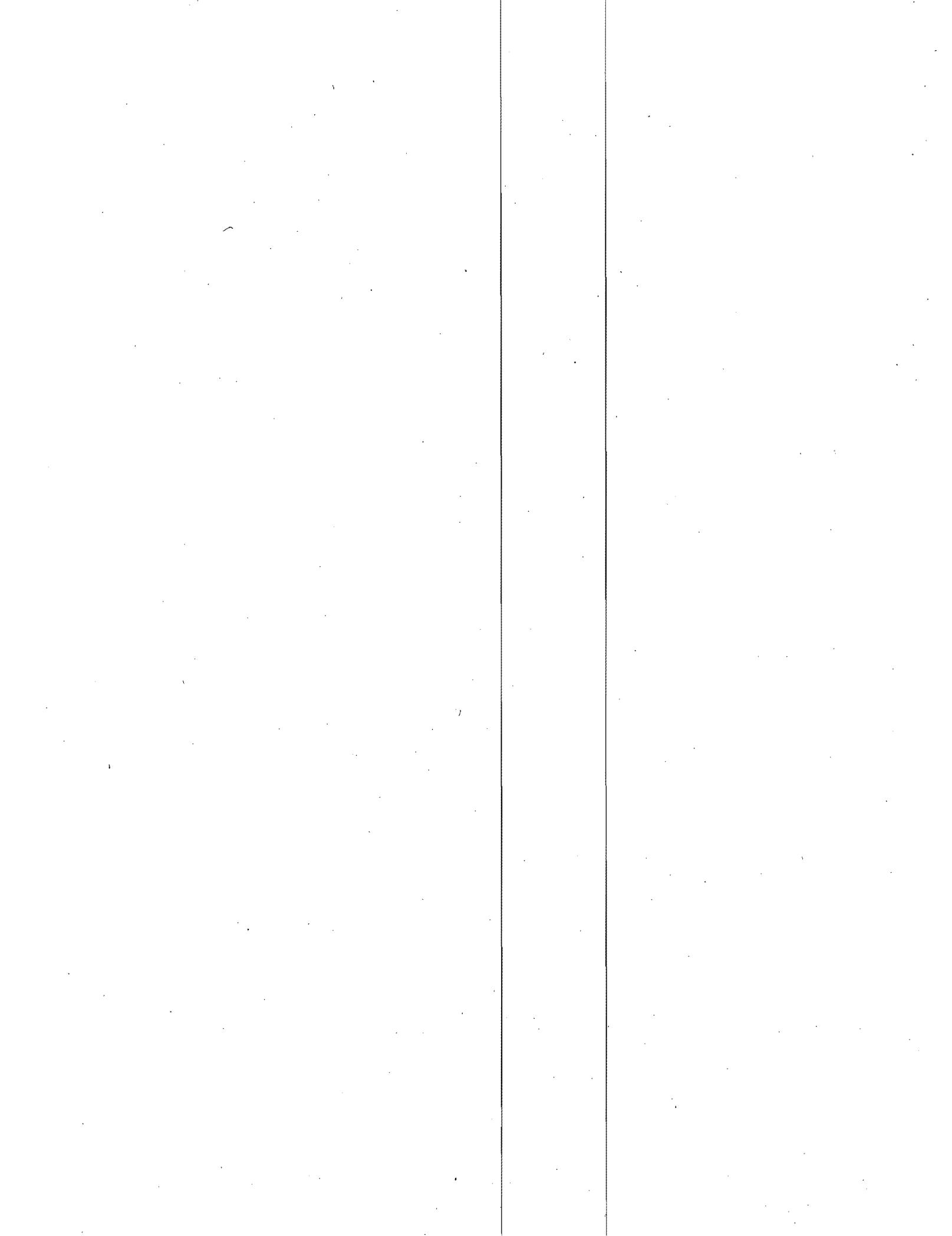
Thickness of Contour Area (ft)	Horizontal Area (ft ²)	Total Volume (ft ³)
0.1 contour 0.1 x	687,381	68,738
1.0 contour 1 x	582,984	582,984
10.0 contour 10 x	49,682	496,824

Total Volume of Groundwater & Soil (ft ³)	Porosity of Soil	Volume of Product (ft ³)
0.1 contour 68,738	30%	20,621
1.0 contour 582,984	30%	174,895
10.0 contour 496,824	30%	149,047
Total:		344,564

Conversion to gallons: 344,564 ft³ x 7.48 gal/ft³ = 2,577,339 gallons

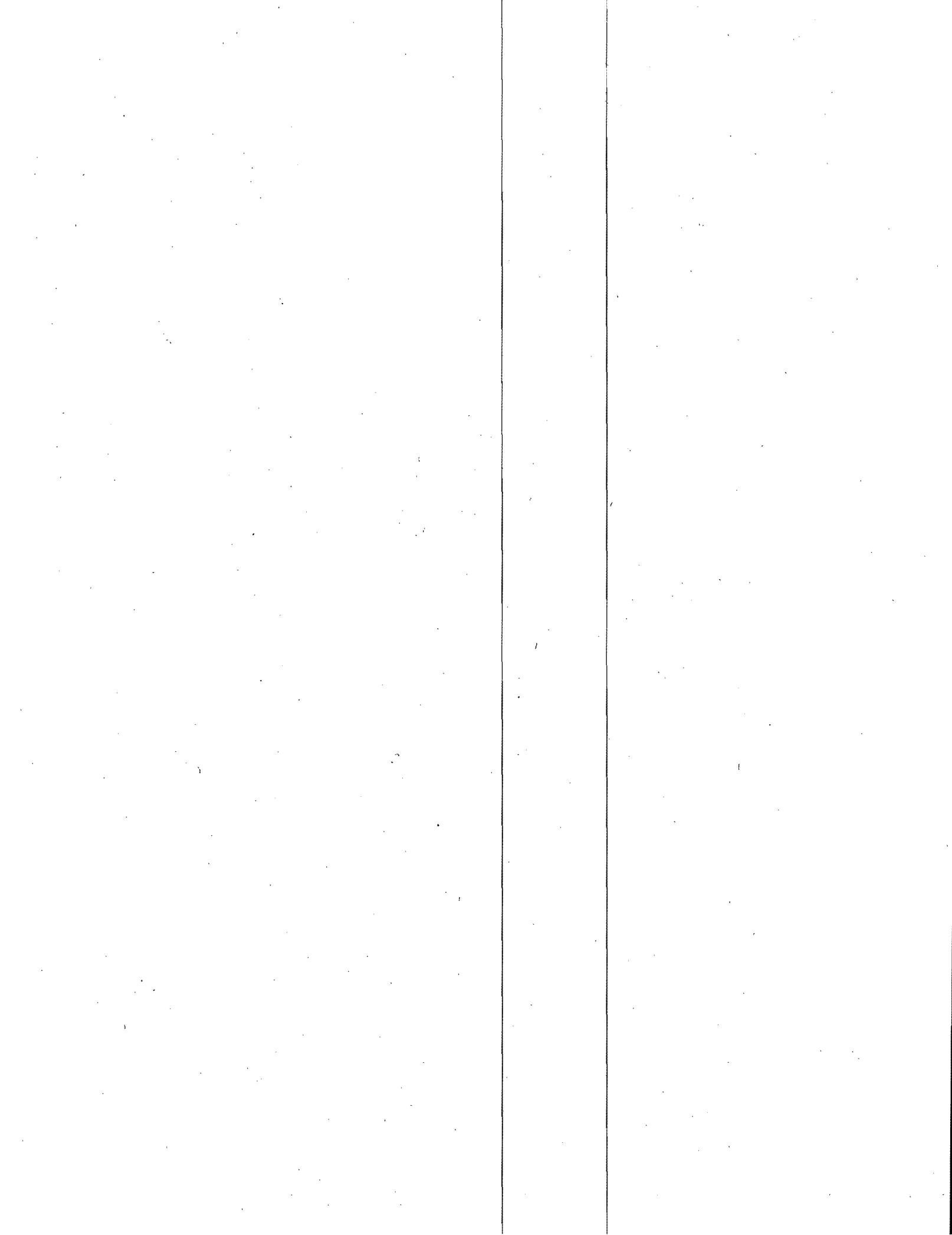
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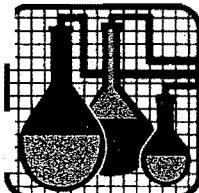
**APPENDIX
C**



APPENDIX C

CERTIFICATES OF ANALYSIS GROUNDWATER SAMPLES





SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A149981
Sample ID: OW-6
Sample Type: Water
Site ID: 9-791214

Project: 799453
Project Name: SEMIANN MONT. 2
Sampler: T. CAMPBELL/W. CONNOLLY

Date Collected: 9/28/99
Time Collected: 9:45
Date Received: 9/30/99
Time Received: 9:00

Analyst	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
ORGANIC PARAMETERS										
Benzene	ND	ng/l	0.0010	0.0010	1	10/ 5/99	22:33	D. Raney	80218	4873
Toluene	0.0065	ng/l	0.0010	0.0010	1	10/ 5/99	22:33	D. Raney	80218	4873
Ethylbenzene	0.0067	ng/l	0.0010	0.0010	1	10/ 5/99	22:33	D. Raney	80218	4873
Xylenes, total	0.0587	ng/l	0.0010	0.0010	1	10/ 5/99	22:33	D. Raney	80218	4873
Gasoline Range Organics	0.28	ng/l	0.10	0.10	1	10/ 5/99	22:33	D. Raney	TOHE	4873

Sample for DRD analysis incorrectly prepped, client is re-sampling.

ND = Not detected at the report limit.

Surrogate	% Recovery	Target Range
STEX/GRO Surrt., a,a,a-trifluorotoluene	105.	50. - 150.

These results relate only to the items tested.

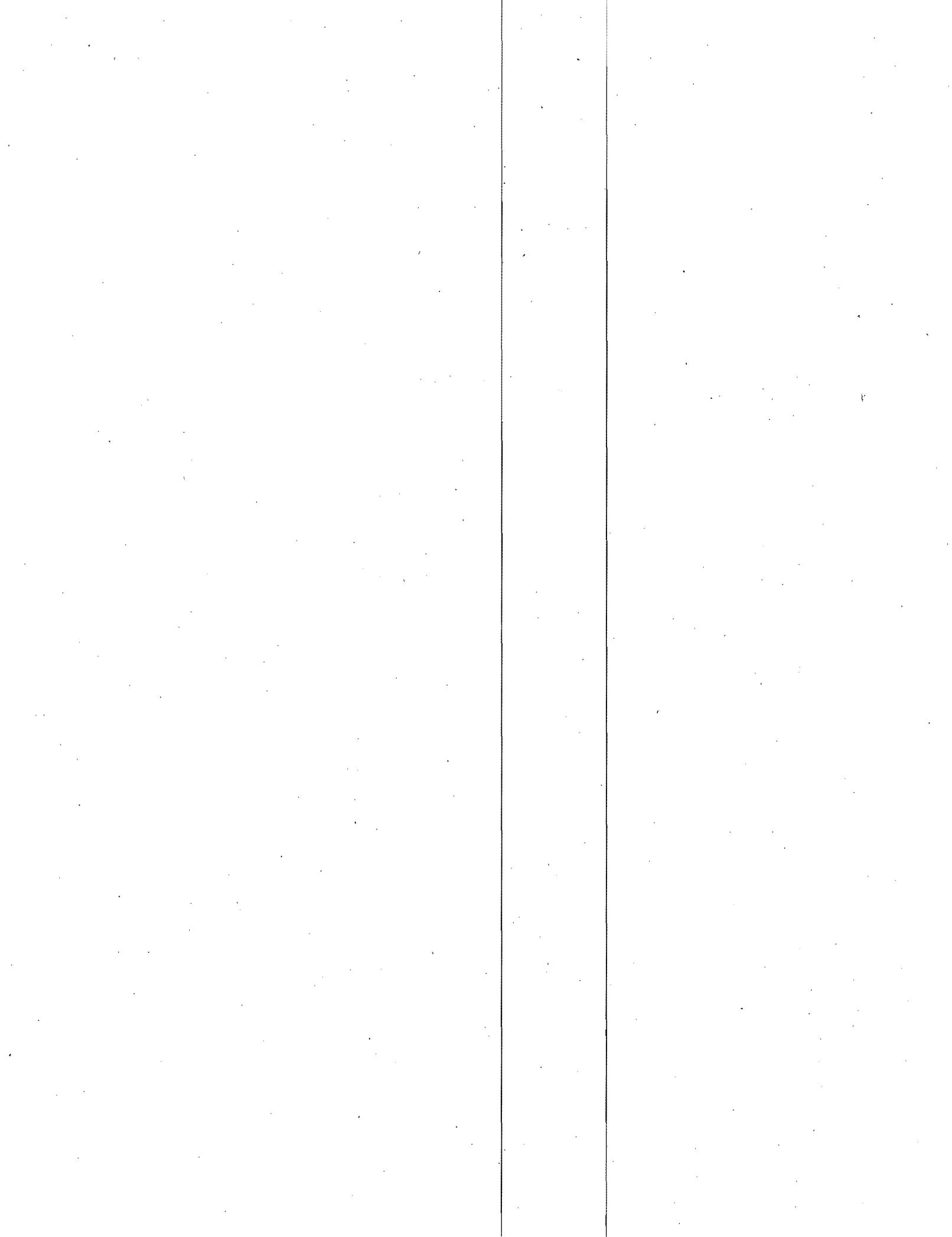
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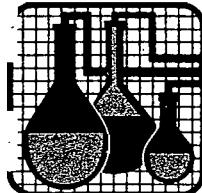
Report Approved By:

Report Date: 10/ 7/99

Theodore J. Dueilo, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lage, Technical Services

Laboratory Certification Number: 02008





SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A149982
Sample ID: OW-38
Sample Type: Water
Site ID: 9-791214

Project: 799453
Project Name: SEMIANN MONT. 2
Sampler: T. CAMPBELL/W. CONNOLLY

Date Collected: 9/28/99
Time Collected: 10:09
Date Received: 9/30/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Ruan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
ORGANIC PARAMETERS										
Benzene	0.0128	ug/l	0.0010	0.0010	1	10/ 5/99	23:59	D.Raney	80218	4873
Toluene	0.0708	ug/l	0.0010	0.0010	1	10/ 5/99	23:59	D.Raney	80218	4873
Ethylbenzene	0.0096	ug/l	0.0010	0.0010	1	10/ 5/99	23:59	D.Raney	80218	4873
Xylenes, total	0.0585	ug/l	0.0010	0.0010	1	10/ 5/99	23:59	D.Raney	80218	4873
Gasoline Range Organics	0.34	ug/l	0.10	0.10	1	10/ 5/99	23:59	D.Raney	TOHE	4873

Sample for DRD analysis incorrectly prepped, client is re-sampling.

ND = Not detected at the report limit.

Surrogate	% Recovery	Target Range
TEX/SND Surr., a,a,a-trifluorotoluene	100.	50. - 150.

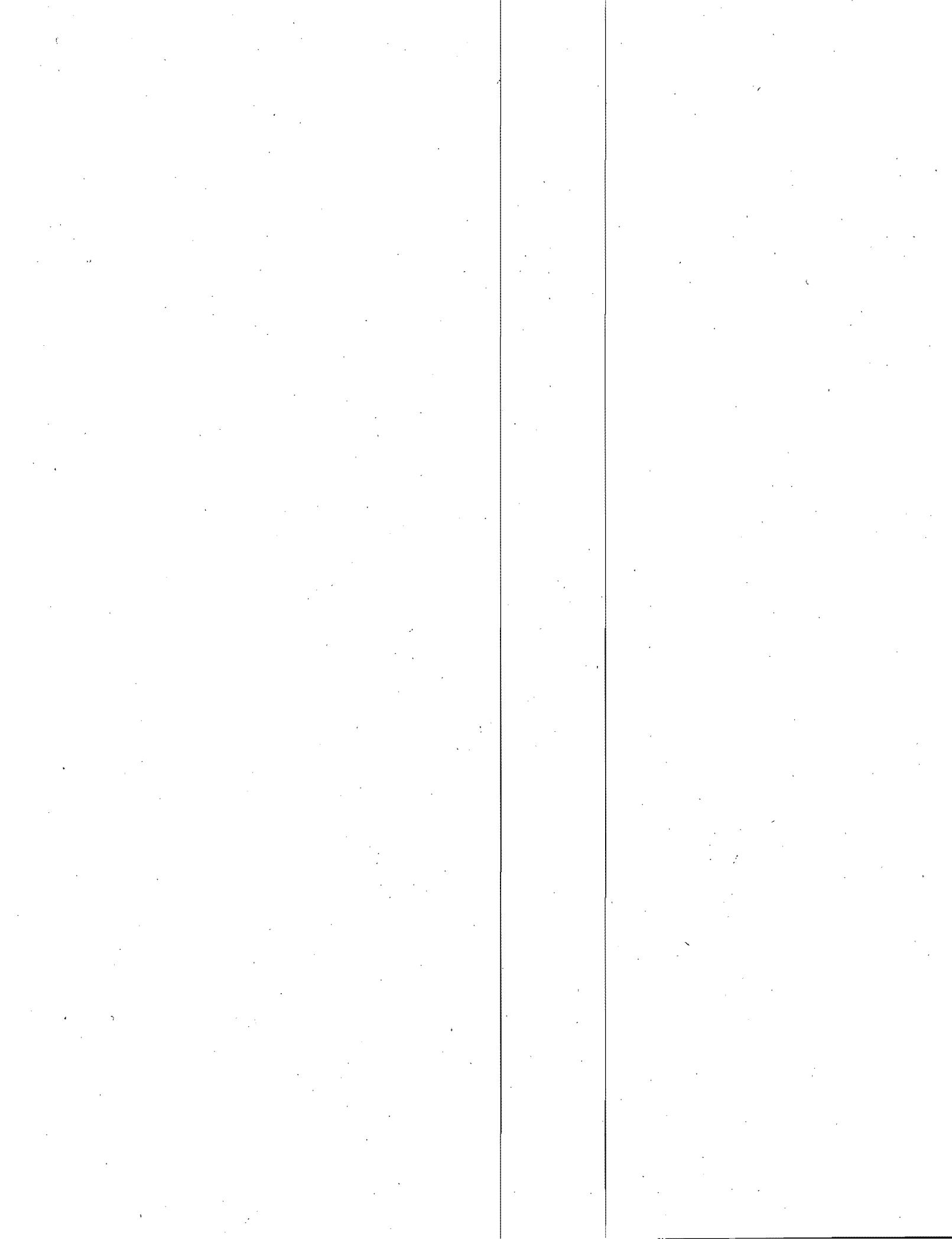
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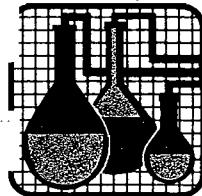
Report Approved By:

Report Date: 10/ 7/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lage, Technical Services

Laboratory Certification Number: 02008





SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A149983
Sample ID: OW-34R
Sample Type: Water
Site ID: 9-791214

Project: 799453
Project Name: SEMIANN MONT. E
Sampler: T. CAMPBELL/W. CONNOLLY

Date Collected: 9/28/99
Time Collected: 18:53
Date Received: 9/30/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Spec Limit	Oil Factor	Date	Time	Analyst	Method	Batch
ORGANIC PARAMETERS										
Benzene	ND	ng/l	0.0010	0.0010	1	10/ 6/99	0:28	D. Ramey	8021B	4873
Toluene	ND	ng/l	0.0010	0.0010	1	10/ 6/99	0:28	D. Ramey	8021B	4873
Ethylbenzene	ND	ng/l	0.0010	0.0010	1	10/ 6/99	0:28	D. Ramey	8021B	4873
Xylenes, total	ND	ng/l	0.0010	0.0010	1	10/ 6/99	0:28	D. Ramey	8021B	4873
Gasoline Range Organics	ND	ng/l	0.10	0.10	1	10/ 6/99	0:28	D. Ramey	TDME	4873

Sample for DEB analysis incorrectly prepped, client is re-sampling.

ND = Not detected at the report limit.

Surrogate	% Recovery	Target Range
TEX/GRD Surr., 2,2,2-trifluorotoluene	113.	50. - 150.

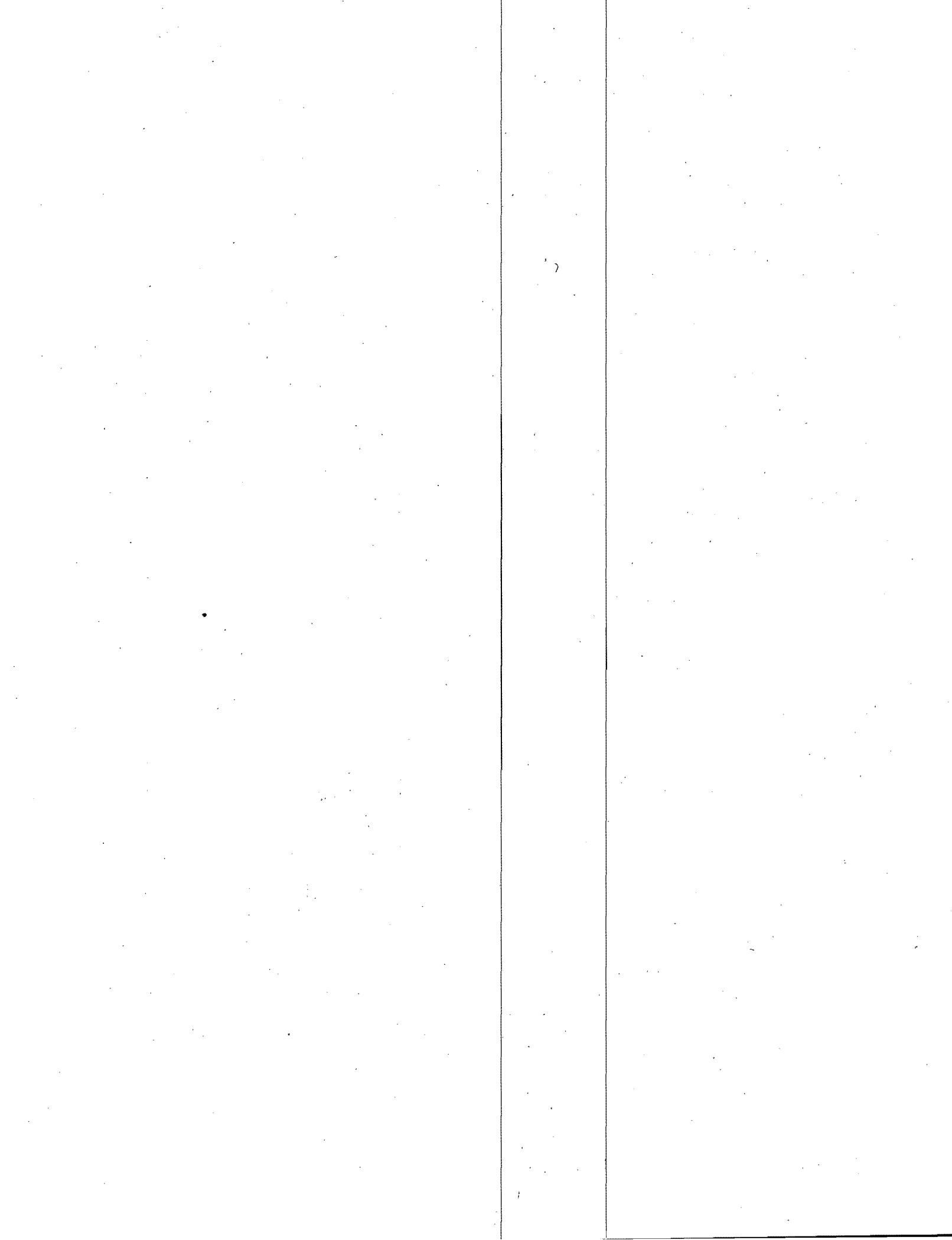
These results relate only to the items tested.
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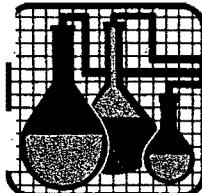
Report Approved By:

Report Date: 10/ 7/99

Theodore J. Duallo, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lage, Technical Services

Laboratory Certification Number: 02008





SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A149984
Sample ID: DW-15
Sample Type: Water
Site ID: 9-791214

Project: 799453
Project Name: SEMIANN MONT. 2
Sampler: T. CAMPBELL/W. CONNOLLY

Date Collected: 9/28/99
Time Collected: 18:07
Date Received: 9/30/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
MORGANIC PARAMETERS										
Benzene	0.0038	ng/l	0.0010	0.0010	1	10/ 6/99	0:57	D. Ramey	8021B	4873
Toluene	0.0026	ng/l	0.0010	0.0010	1	10/ 6/99	0:57	D. Ramey	8021B	4873
Ethylbenzene	0.0010	ng/l	0.0010	0.0010	1	10/ 6/99	0:57	D. Ramey	8021B	4873
Xylenes, total	0.0033	ng/l	0.0010	0.0010	1	10/ 6/99	0:57	D. Ramey	8021B	4873
Gasoline Range Organics	ND	ng/l	0.10	0.10	1	10/ 6/99	0:57	D. Ramey	TDME	4873

Sample for DRD analysis incorrectly prepped, client is re-sampling.

ND = Not detected at the report limit.

Surrogate	% Recovery	Target Range
BTEx/GRD Surr., 1,1,2-trifluorotoluene	106.	50. - 150.

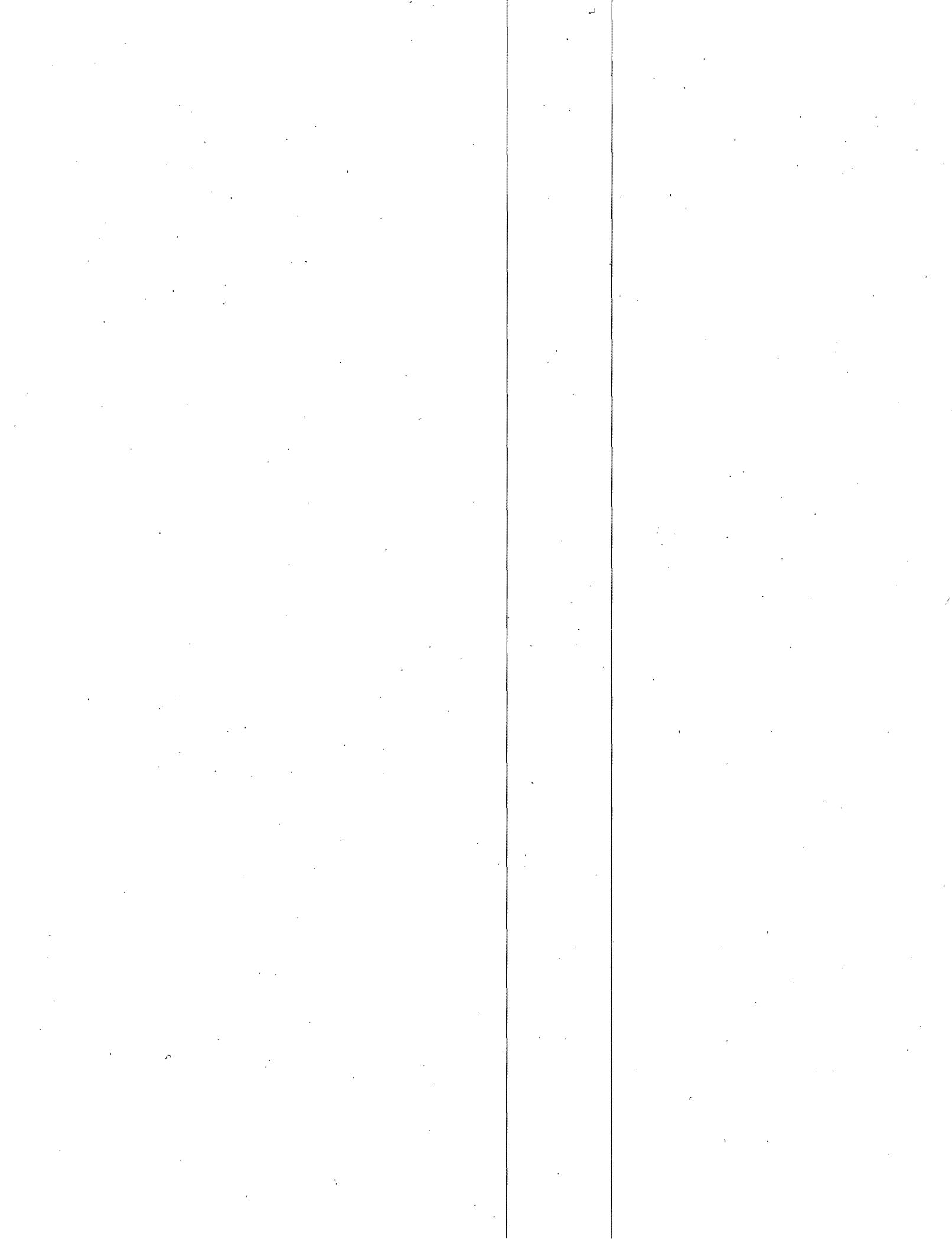
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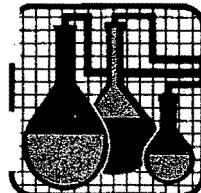
Report Approved By:

Report Date: 10/ 7/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lage, Technical Services

Laboratory Certification Number: 02008





SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A149985
Sample ID: OW-40
Sample Type: Water
Site ID: 9-791214

Project: 799453
Project Name: SEMIANN MONT. 2
Sampler: T. CAMPBELL/W. CONNOLLY

Date Collected: 9/28/99
Time Collected: 17:44
Date Received: 9/30/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Ruan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
ORGANIC PARAMETERS										
Benzene	ND	ng/l	0.0010	0.0010	1	10/ 6/99	1:26	D. Ramey	80218	4873
Toluene	ND	ng/l	0.0010	0.0010	1	10/ 6/99	1:26	D. Ramey	80218	4873
Ethylbenzene	ND	ng/l	0.0010	0.0010	1	10/ 6/99	1:26	D. Ramey	80218	4873
Xylenes, total	ND	ng/l	0.0010	0.0010	1	10/ 6/99	1:26	D. Ramey	80218	4873
Gasoline Range Organics	ND	ng/l	0.10	0.10	1	10/ 6/99	1:26	D. Ramey	TDME	4873

Sample for DBO analysis incorrectly prepped, client is re-sampling.

ND = Not detected at the report limit.

Surrogate	% Recovery	Target Range
TEX/CRD Surrogate, a,a,a-trifluorotoluene	110.	50. - 150.

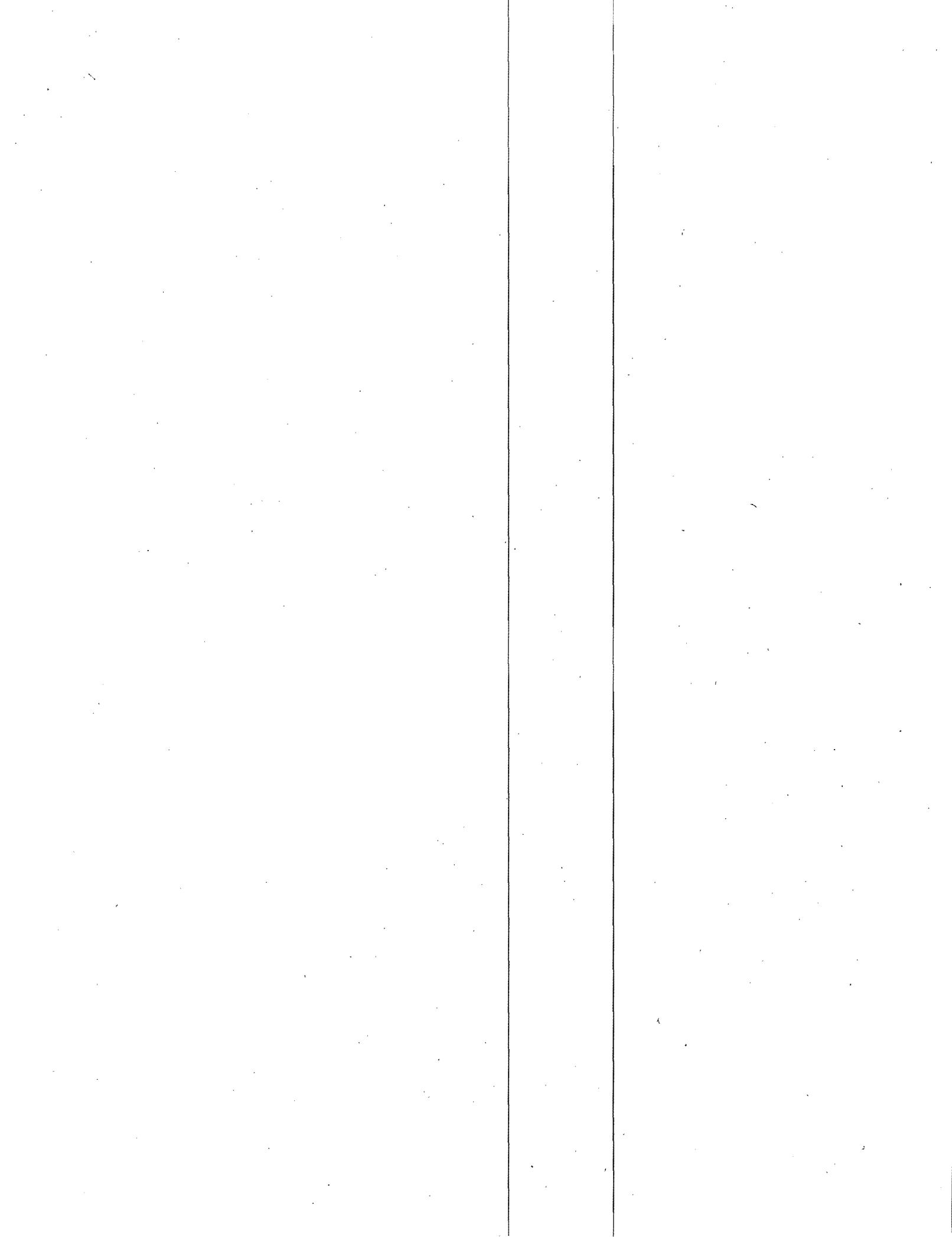
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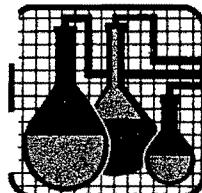
Report Approved By:

Report Date: 10/ 7/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
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ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A149986
Sample ID: DW-43
Sample Type: Water
Site ID: 9-791214

Project: 799453
Project Name: SEMIANN MONT. 2
Sampler: T. CAMPBELL/W. CONNOLLY

Date Collected: 9/28/99
Time Collected: 16:19
Date Received: 9/30/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Ran Limit	Dil Factor	Date	Time	Analyst	Method	Batch
MORGANIC PARAMETERS										
Benzene	0.0081	ng/l	0.0010	0.0010	1	10/ 6/99	1:55	D.Raney	8021B	4873
Toluene	0.0059	ng/l	0.0010	0.0010	1	10/ 6/99	1:55	D.Raney	8021B	4873
Ethylbenzene	0.0017	ng/l	0.0010	0.0010	1	10/ 6/99	1:55	D.Raney	8021B	4873
Xylenes, total	0.0087	ng/l	0.0010	0.0010	1	10/ 6/99	1:55	D.Raney	8021B	4873
Gasoline Range Organics	ND	ng/l	0.10	0.10	1	10/ 6/99	1:55	D.Raney	TDHE	4873

Sample for DRD analysis incorrectly prepped, client is re-sampling.

ND = Not detected at the report limit.

Surrogate	% Recovery	Target Range
KTEX/GRD Surr., 2,2,2-trifluorotoluene	102.	50. - 150.

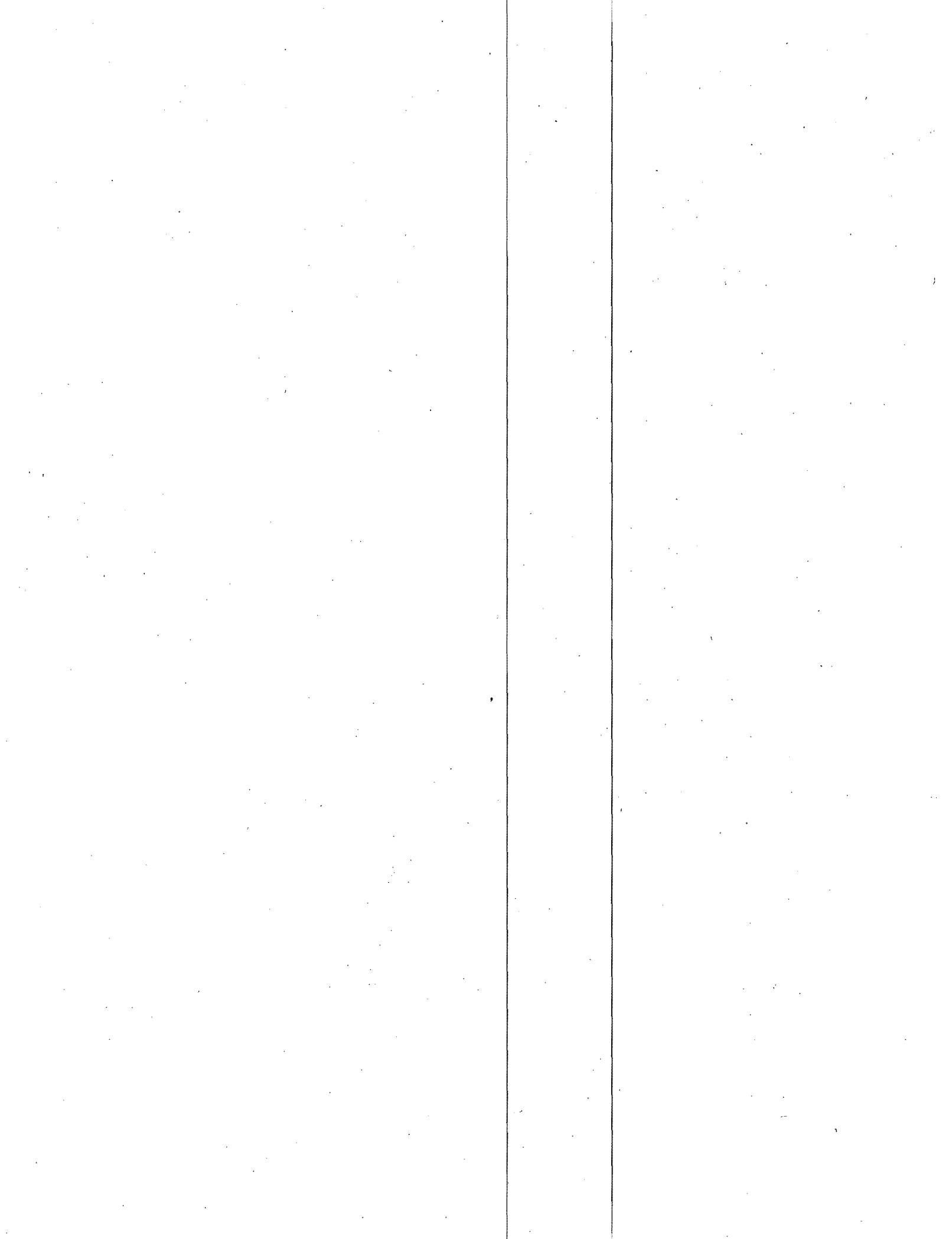
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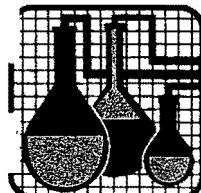
Report Approved By:

Report Date: 10/ 7/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lage, Technical Services

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ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A149987
Sample ID: MW-1
Sample Type: Water
Site ID: 9-791214

Project: 799453
Project Name: SEMIANN MONT. 2
Sampler: T. CAMPBELL/W. CONNOLLY

Date Collected: 9/28/99
Time Collected: 15:13
Date Received: 9/30/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Run Limit	Oil Factor	Date	Time	Analyst	Method	Batch
MORGANIC PARAMETERS										
Benzene	0.0047	ng/l	0.0010	0.0010	1	10/ 6/99	2:24	D. Ramey	8021B	4873
Toluene	0.0015	ng/l	0.0010	0.0010	1	10/ 6/99	2:24	D. Ramey	8021B	4873
Ethylbenzene	0.0010	ng/l	0.0010	0.0010	1	10/ 6/99	2:24	D. Ramey	8021B	4873
Xylenes, total	0.0049	ng/l	0.0010	0.0010	1	10/ 6/99	2:24	D. Ramey	8021B	4873
Gasoline Range Organics	ND	ng/l	0.10	0.10	1	10/ 6/99	2:24	D. Ramey	TDHE	4873

Sample for DRN analysis incorrectly prepped, client is re-sampling.

ND = Not detected at the report limit.

Surrogate	% Recovery	Target Range
KTEX/GRD Sur., 2,2,2-trifluorotoluene	105.	50. - 150.

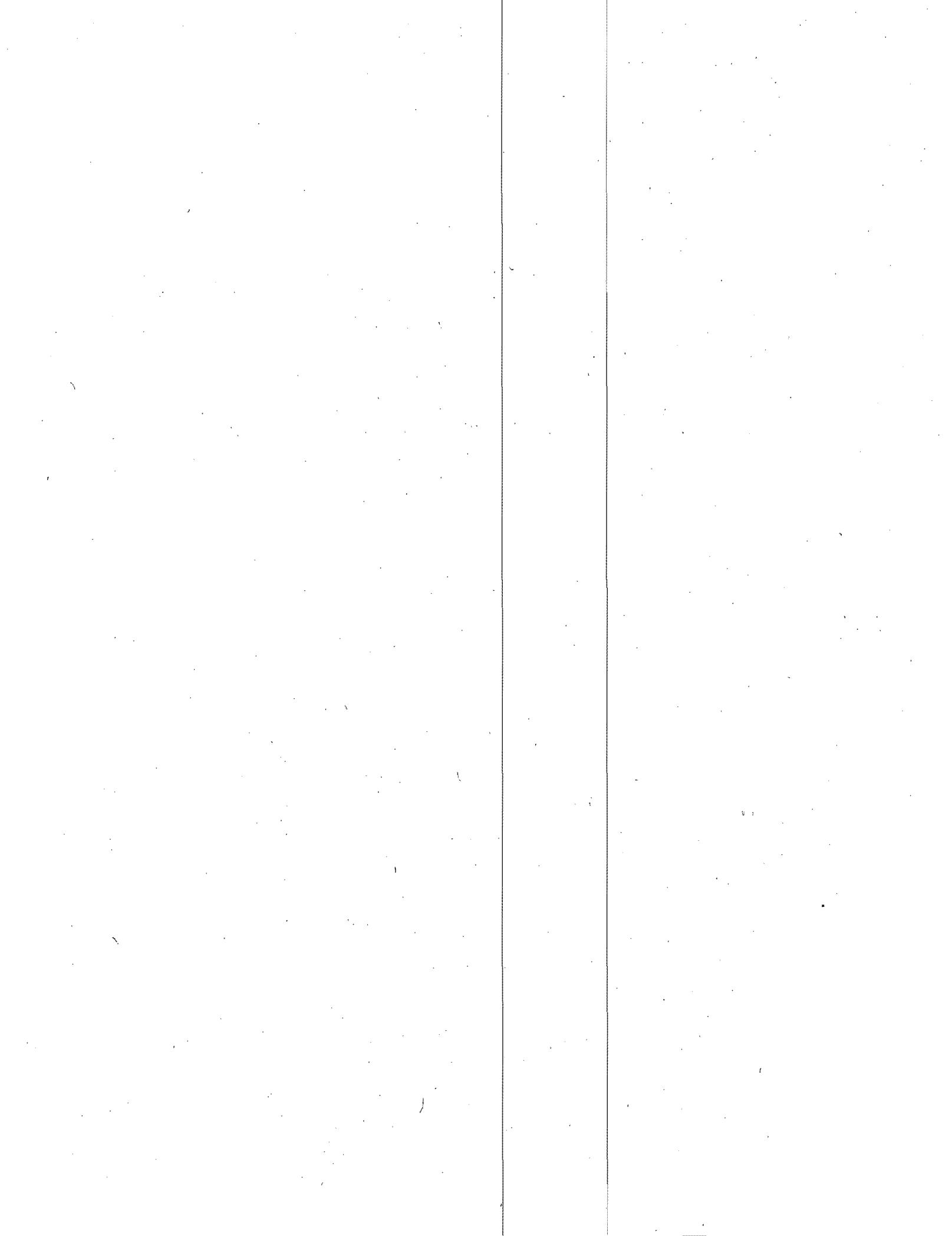
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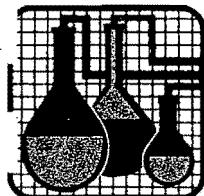
Report Approved By:

Report Date: 10/ 7/99

Theodore J. Duelle, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lage, Technical Services

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ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A149988
Sample ID: DW-32
Sample Type: Water
Site ID: 9-791214

Project: 799453
Project Name: SEMIANN MONT. Z
Sampler: T. CAMPBELL/W. CONNOLLY

Date Collected: 9/28/99
Time Collected: 13:38
Date Received: 9/30/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
MORGANIC PARAMETERS										
Benzene	ND	ng/l	0.0010	0.0010	1	10/ 6/99	2:54	D.Raney	8021B	4873
Toluene	ND	ng/l	0.0010	0.0010	1	10/ 6/99	2:54	D.Raney	8021B	4873
Ethylbenzene	ND	ng/l	0.0010	0.0010	1	10/ 6/99	2:54	D.Raney	8021B	4873
Xylenes, total	ND	ng/l	0.0010	0.0010	1	10/ 6/99	2:54	D.Raney	8021B	4873
Gasoline Range Organics	ND	ng/l	0.10	0.10	1	10/ 6/99	2:54	D.Raney	TDME	4873

Sample for DRD analysis incorrectly prepped, client is re-sampling.

ND = Not detected at the report limit.

Surrogate	% Recovery	Target Range
UTEX/GRD Surr., a,a,a-trifluorotoluene	113.	50. - 150.

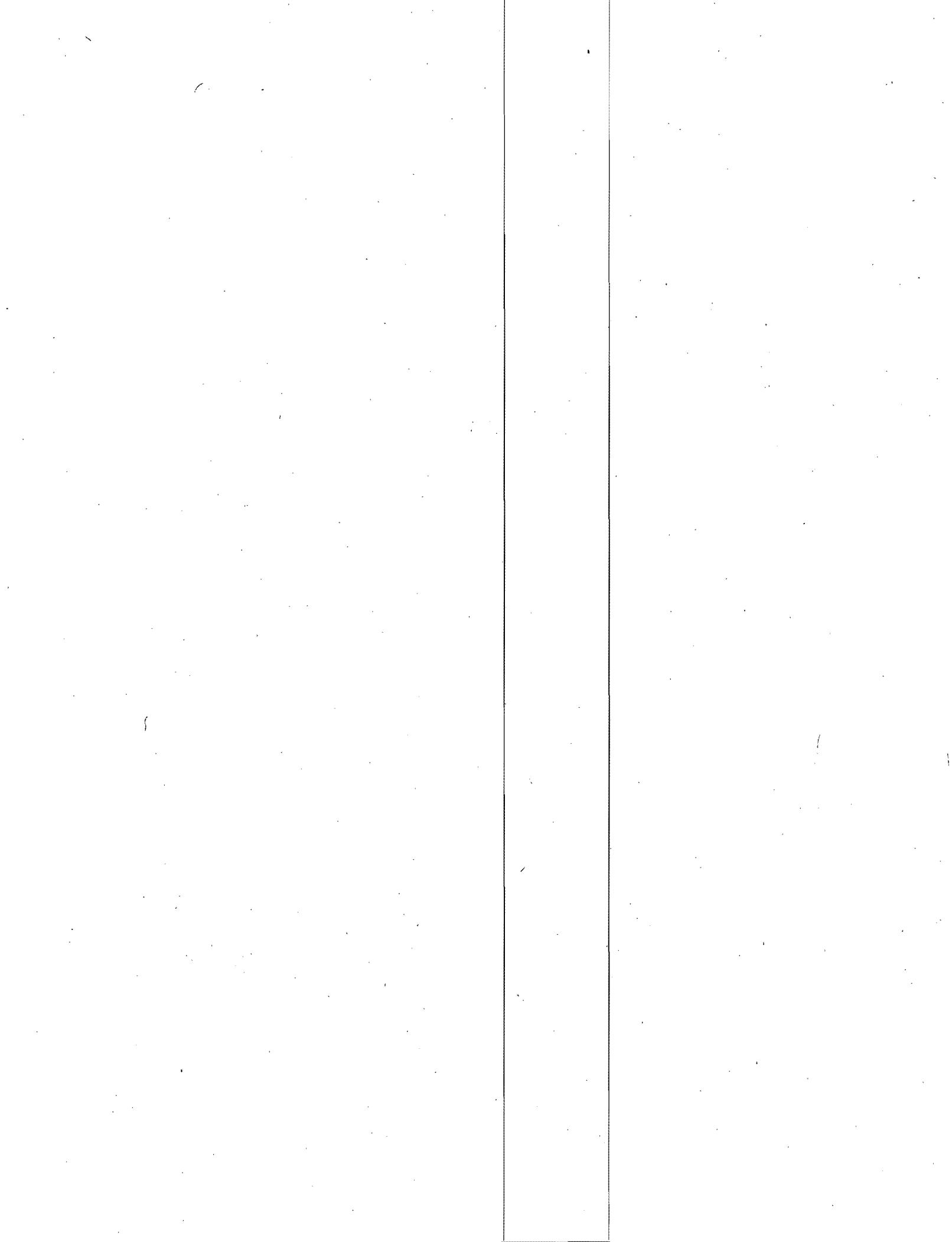
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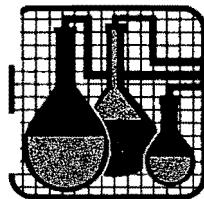
Report Approved By:

Report Date: 10/ 7/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
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ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A149989
Sample ID: DW-31
Sample Type: Water
Site ID: 9-791214

Project: 799453
Project Name: SEMIANN MONT. 2
Sampler: T. CAMPBELL/W. CONNOLLY

Date Collected: 9/28/99
Time Collected: 14:03
Date Received: 9/30/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
ORGANIC PARAMETERS										
Benzene	1.964	mg/l	0.0200	0.0010	20	10/ 6/99	3:23	D. Ramey	80210	4873
Toluene	0.1128	mg/l	0.0200	0.0010	20	10/ 6/99	3:23	D. Ramey	80210	4873
Ethylbenzene	0.0360	mg/l	0.0200	0.0010	20	10/ 6/99	3:23	D. Ramey	80210	4873
Xylenes, total	0.6740	mg/l	0.0200	0.0010	20	10/ 6/99	3:23	D. Ramey	80210	4873
Gasoline Range Organics	4.48	mg/l	2.00	0.10	20	10/ 6/99	3:23	D. Ramey	TDHE	4873

Sample for DRW analysis incorrectly prepped, client is re-sampling.

ND = Not detected at the report limit.

Surrogate	% Recovery	Target Range
STEX/GRI Surr., 3,a,a-trifluorotoluene	82.	50. - 150.

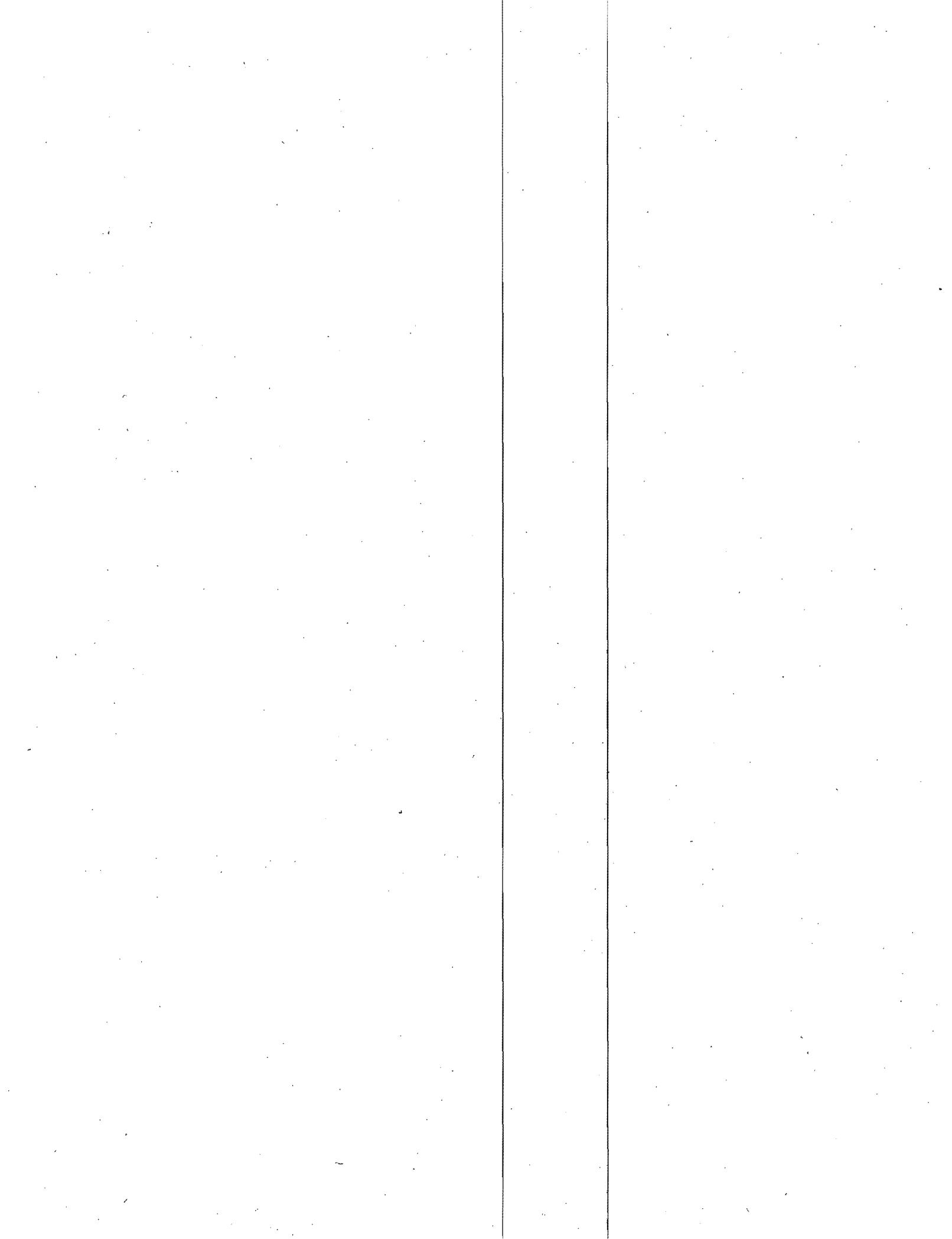
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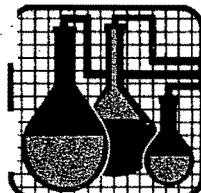
Report Approved By:

Report Date: 10/ 7/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lage, Technical Services

Laboratory Certification Number: 02008





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Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A149990
Sample ID: DW-30
Sample Type: Water
Site ID: 9-791214

Project: 799453
Project Name: SEMIANN MONT. 2
Sampler: T. CAMPBELL/W. CONNOLLY

Date Collected: 9/28/99
Time Collected: 13:00
Date Received: 9/30/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Oil Factor	Date	Time	Analyst	Method	Batch
MORGANIC PARAMETERS										
Benzene	ND	mg/l	0.0010	0.0010	1	10/ 6/99	6:17	D.Raney	8021B	4873
Toluene	ND	mg/l	0.0010	0.0010	1	10/ 6/99	6:17	D.Raney	8021B	4873
Ethylbenzene	ND	mg/l	0.0010	0.0010	1	10/ 6/99	6:17	D.Raney	8021B	4873
Xylenes, total	ND	mg/l	0.0010	0.0010	1	10/ 6/99	6:17	D.Raney	8021B	4873
Gasoline Range Organics	ND	mg/l	0.10	0.10	1	10/ 6/99	6:17	D.Raney	TDHE	4873

Sample for DRD analysis incorrectly prepped, client is re-sampling.

ND = Not detected at the report limit.

Surrogate	% Recovery	Target Range
OTEX/GRD Surr., α,α,α -trifluorotoluene	109.	50. - 150.

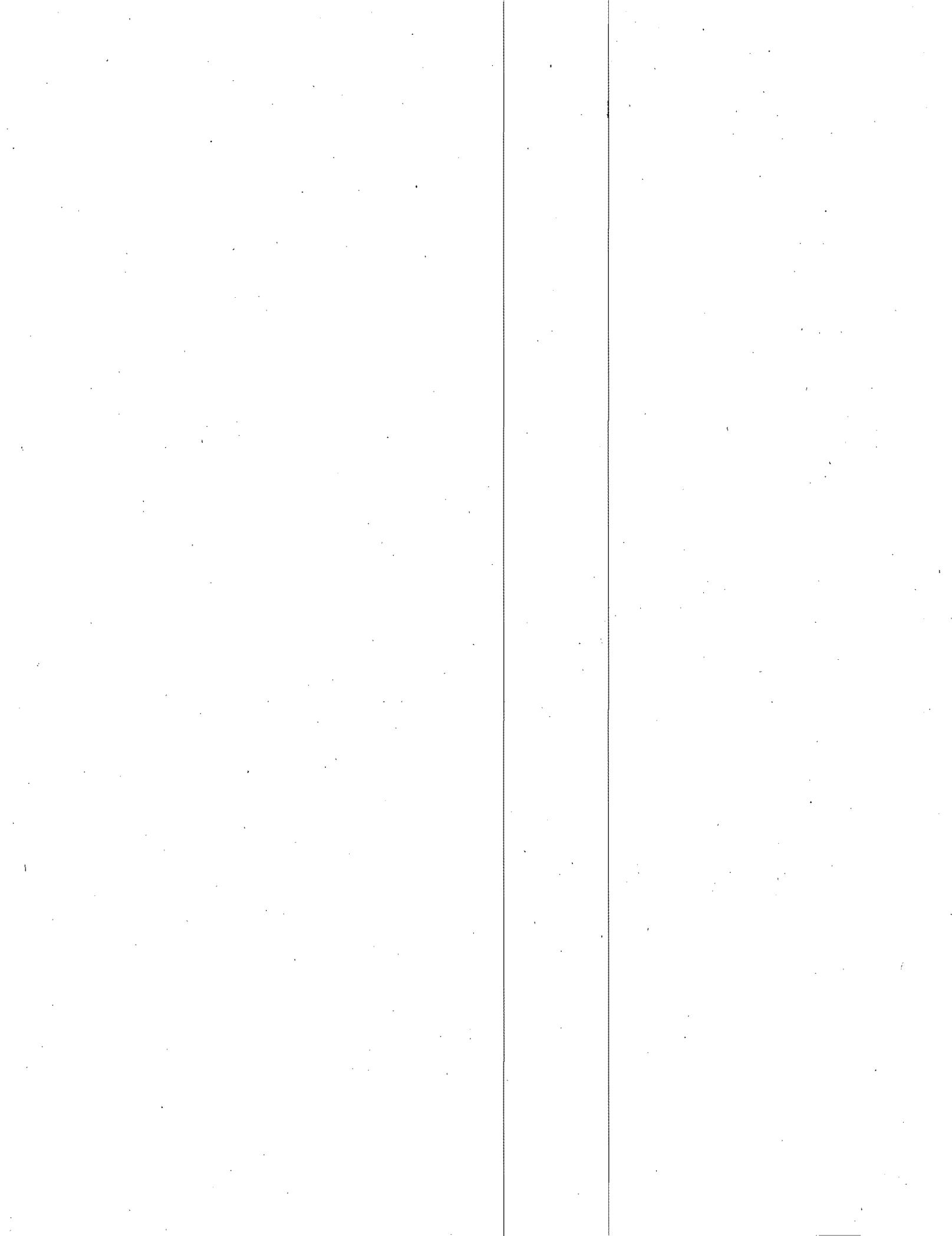
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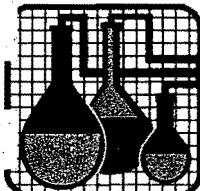
Report Approved By:

Report Date: 10/ 7/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
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Laboratory Certification Number: 02008





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2960 Foster Creighton Dr.
P.O. Box 40566
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ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A149991
Sample ID: DW-29R
Sample Type: Water
Site ID: 9-791214

Project: 799453
Project Name: SEMIANN MONT. 2
Sampler: T. CAMPBELL/W. CONNOLLY

Date Collected: 9/28/99
Time Collected: 12:40
Date Received: 9/30/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
ORGANIC PARAMETERS										
Benzene	0.0018	ng/l	0.0010	0.0010	1	10/ 6/99	6:46	D. Raney	8021B	4873
Toluene	0.0020	ng/l	0.0010	0.0010	1	10/ 6/99	6:46	D. Raney	8021B	4873
Ethylbenzene	ND	ng/l	0.0010	0.0010	1	10/ 6/99	6:46	D. Raney	8021B	4873
Xylenes, total	0.0021	ng/l	0.0010	0.0010	1	10/ 6/99	6:46	D. Raney	8021B	4873
Gasoline Range Organics	ND	ng/l	0.10	0.10	1	10/ 6/99	6:46	D. Raney	TOHE	4873

Sample for DOD analysis incorrectly prepped, client is re-sampling.

ND = Not detected at the report limit.

Surrogate	% Recovery	Target Range
OTEX/GRI Surr., a,a,a-trifluorotoluene	109.	50. - 150.

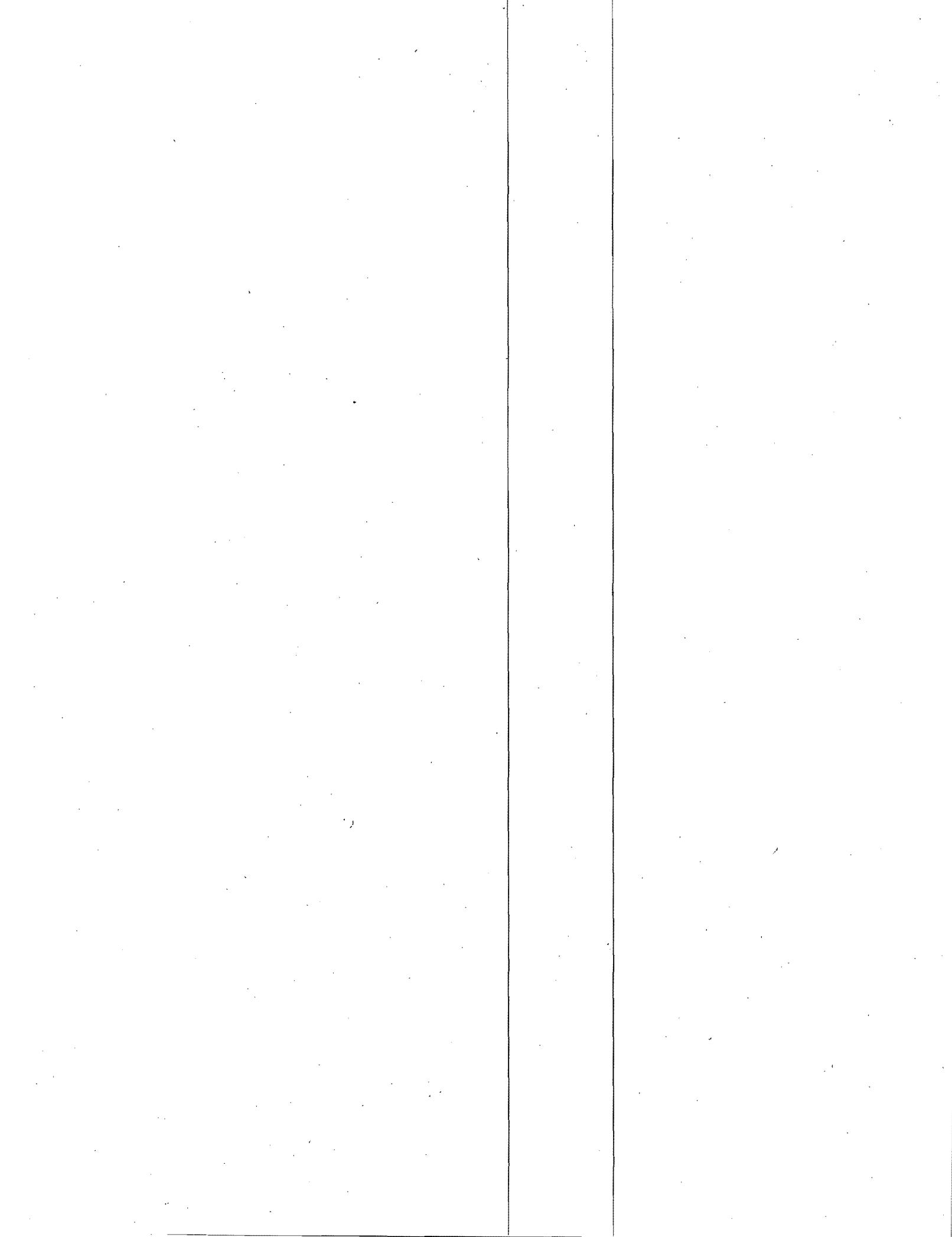
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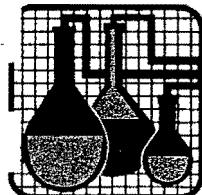
Report Approved By:

Report Date: 10/ 7/99

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PROJECT QUALITY CONTROL DATA

Matrix Spike Recovery

Analyte	units	Orig. Val.	NS Val	Spike Conc	Recovery	Target Range	R.C. Batch
Benzene	ng/l	< 0.0010	0.0179	0.0200	90	75. - 125.	4873
Toluene	ng/l	< 0.0010	0.0174	0.0200	87	70. - 125.	4873
Ethylbenzene	ng/l	< 0.0010	0.0175	0.0200	88	71. - 128.	4873
Xylenes, total	ng/l	< 0.0010	0.0378	0.0400	94	71. - 133.	4873
Gasoline Range Organics	ng/l	< 0.10	0.21	0.22	95	69. - 127.	4873

Matrix Spike Duplicate

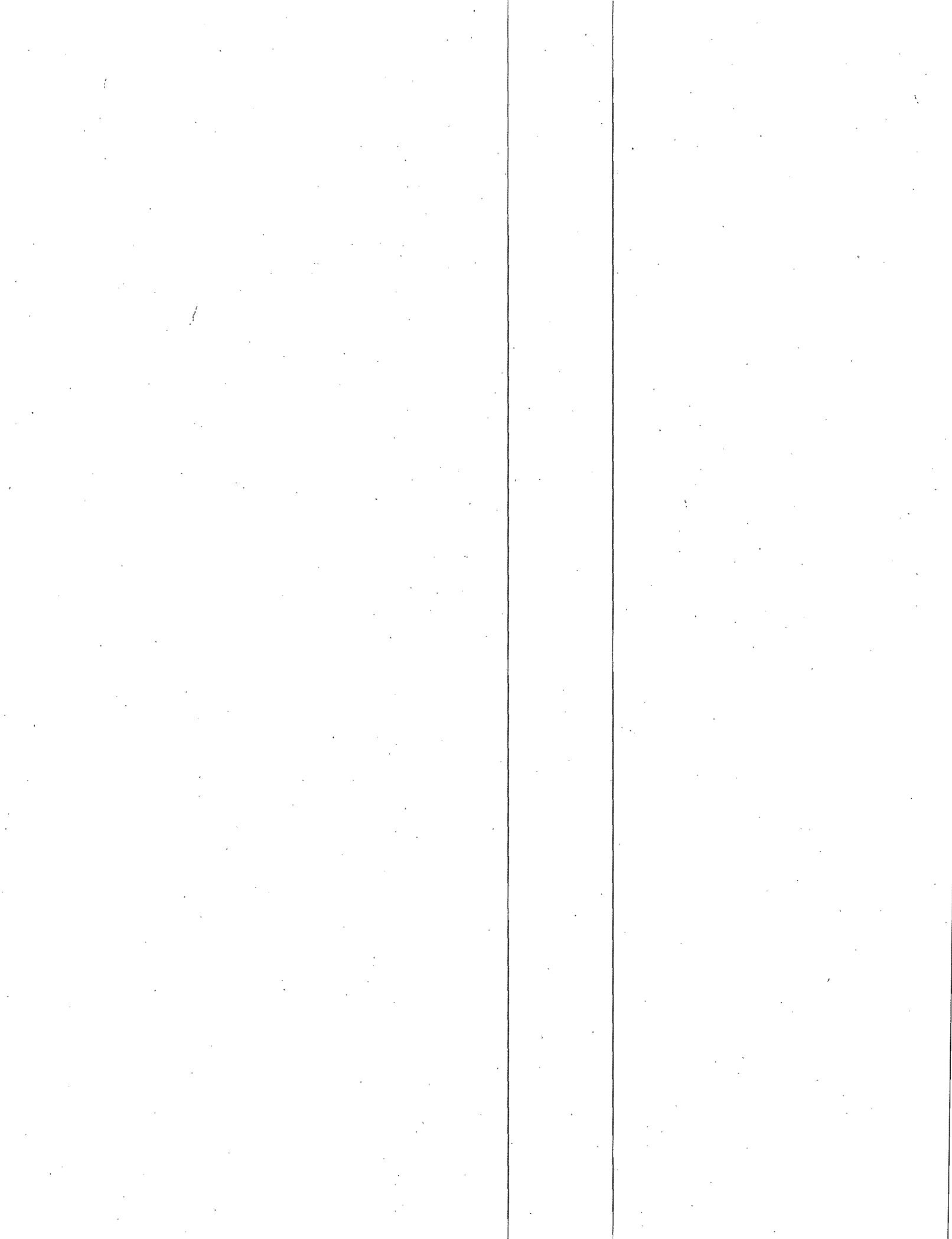
Analyte	units	Orig. Val.	Duplicate	RPD	Limit	R.C. Batch
Benzene	ng/l	0.0179	0.0183	2.21	20.	4873
Toluene	ng/l	0.0174	0.0187	8.26	20.	4873
Ethylbenzene	ng/l	0.0175	0.0188	7.16	20.	4873
Xylenes, total	ng/l	0.0378	0.0402	6.15	20.	4873
Gasoline Range Organics	ng/l	0.21	0.21	0.00	20.	4873

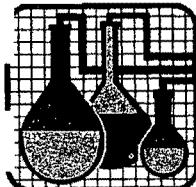
Laboratory Control Data

Analyte	units	Known Val.	Analyzed Val	% Recovery	Target Range	R.C. Batch
Benzene	ng/l	0.0200	0.0173	86	70 - 130	4873
Toluene	ng/l	0.0200	0.0181	90	70 - 130	4873
Ethylbenzene	ng/l	0.0200	0.0181	90	70 - 130	4873
Xylenes, total	ng/l	0.0400	0.0385	96	70 - 130	4873
Gasoline Range Organics	ng/l	0.22	0.20	91	60 - 140	4873

Blank Data

Analyte	Blank Value	Units	R.C. Batch
Benzene	< 0.0010	ng/l	4873
Toluene	< 0.0010	ng/l	4873
Ethylbenzene	< 0.0010	ng/l	4873
Xylenes, total	< 0.0010	ng/l	4873
Gasoline Range Organics	< 0.10	ng/l	4873





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2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
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ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A157811
Sample ID: DW-6
Sample Type: Water
Site ID: 9-791214

Project: SAM2-2 799453
Project Name:
Sampler: T. CAMPBELL

Date Collected: 10/13/99
Time Collected: 13:18
Date Received: 10/15/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Ran Limit	Dil Factor	Date	Time	Analyst	Method	Batch
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INORGANIC PARAMETERS

Ext Petroleum Hyd. (EPH) 2.78 mg/l 0.11 0.10 1 10/18/99 18:37 J.Saigasak TDME 4051

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Extracted	Extract Vol	Date	Analyst	Method
EPH	940. ml	1.00 ml	10/18/99	C. Terry	3510

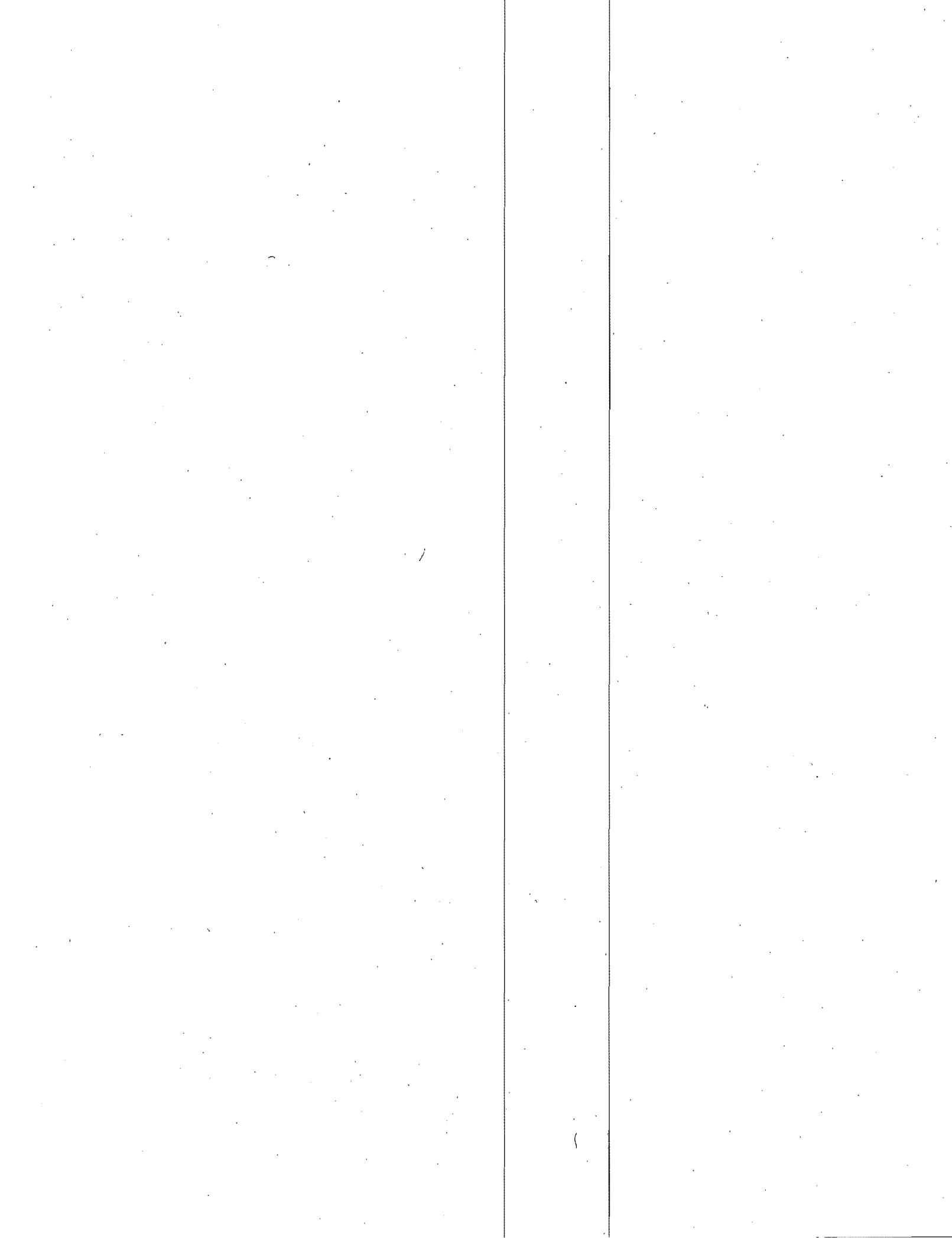
Surrogate	% Recovery	Target Range
surr-o-Terphthalyl	79.	50. - 150.

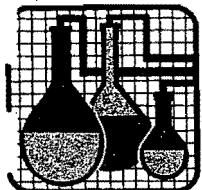
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Report Approved By: Gail A Lage Report Date: 10/22/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lage, Technical Services

Laboratory Certification Number: 02008





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2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Project: SAM2-2 799453
Project Name:
Sampler: T. CAMPBELL

Lab Number: 99-A157812
Sample ID: OW-38
Sample Type: Water
Site ID: 9-791214

Date Collected: 10/14/99
Time Collected: 9:54
Date Received: 10/15/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	RSD	B/F	Factor	Date	Time	Analyst	Method	Batch
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ORGANIC PARAMETERS

Ext Petroleum Hyd. (EPH) 3.25 mg/l 1.01 0.10 10 10/19/99 19:07 J. Salayak TDHE 4051

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol	Extracted	Extract Vol	Date	Analyst	Method
EPH	990. mL	1.00 mL	10/18/99	C. Terry	3510	

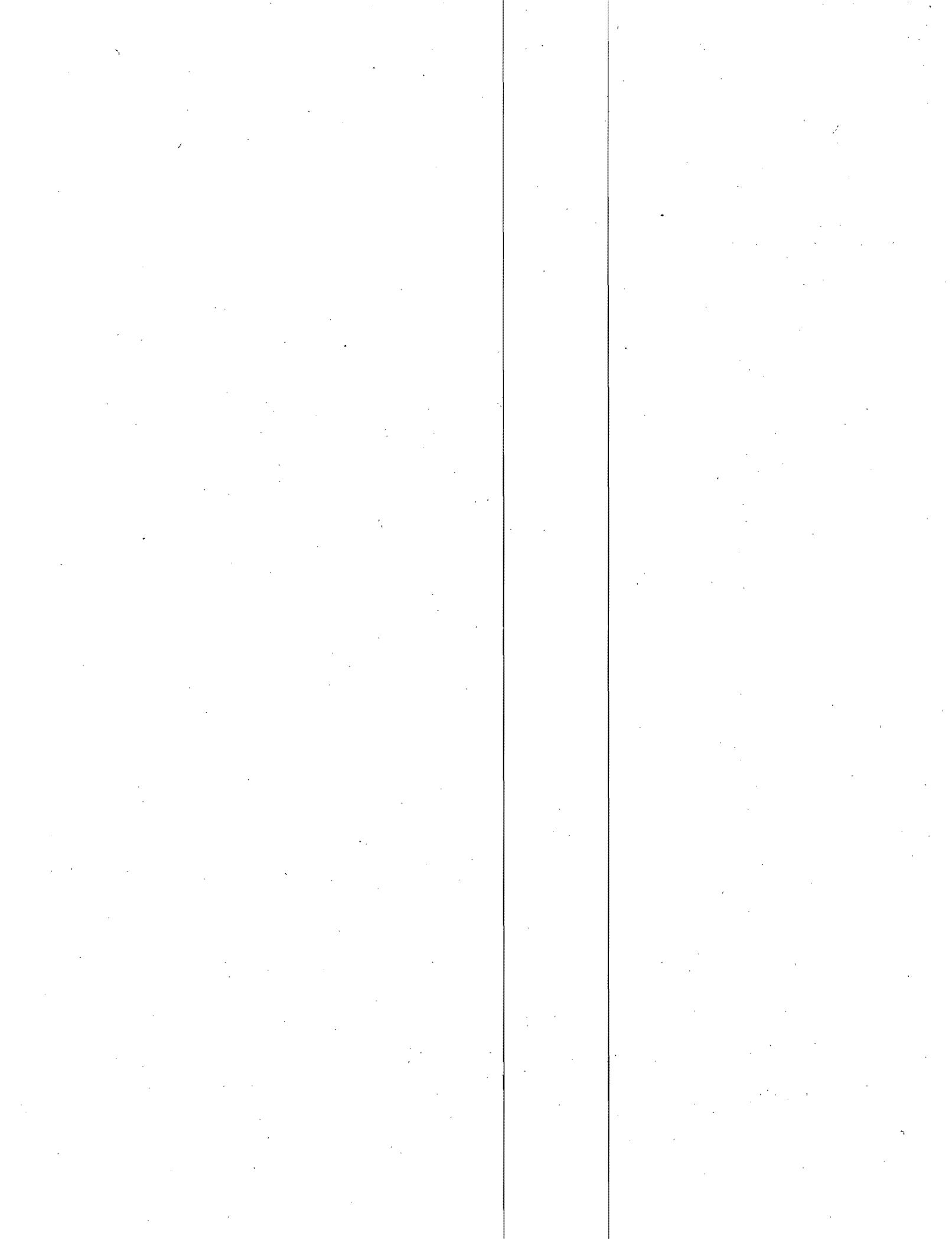
Surrogate	% Recovery	Target Range
surr- α -Terphenyl	110.	50. - 150.

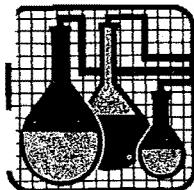
These results relate only to the items tested.
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permission of the laboratory.

Report Approved By: Mark A. Lage Report Date: 10/22/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, B.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lage, Technical Services

Laboratory Certification Number: 02008





SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A157813
Sample ID: OW-34(R)
Sample Type: Water
Site ID: 9-791214

Project: SAM2-2 799453
Project Name:
Sampler: T. CAMPBELL

Date Collected: 10/14/99
Time Collected: 11:31
Date Received: 10/15/99
Time Received: 9:00

Analte	Result	Units	Report Limit	Ran Limit	Oil Factor	Date	Time	Analyst	Method	Batch
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ORGANIC PARAMETERS

Ext Petroleum Hyd. (EPH) ND mg/l 0.10 0.10 1 10/19/99 19:37 J.Saigasak TOHE 4051

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol				
	Extracted	Extract Vol	Date	Analyst	Method
EPH	770. mL	1.00 mL	10/18/99	C. Terry	3510

Surrogate % Recovery Target Range

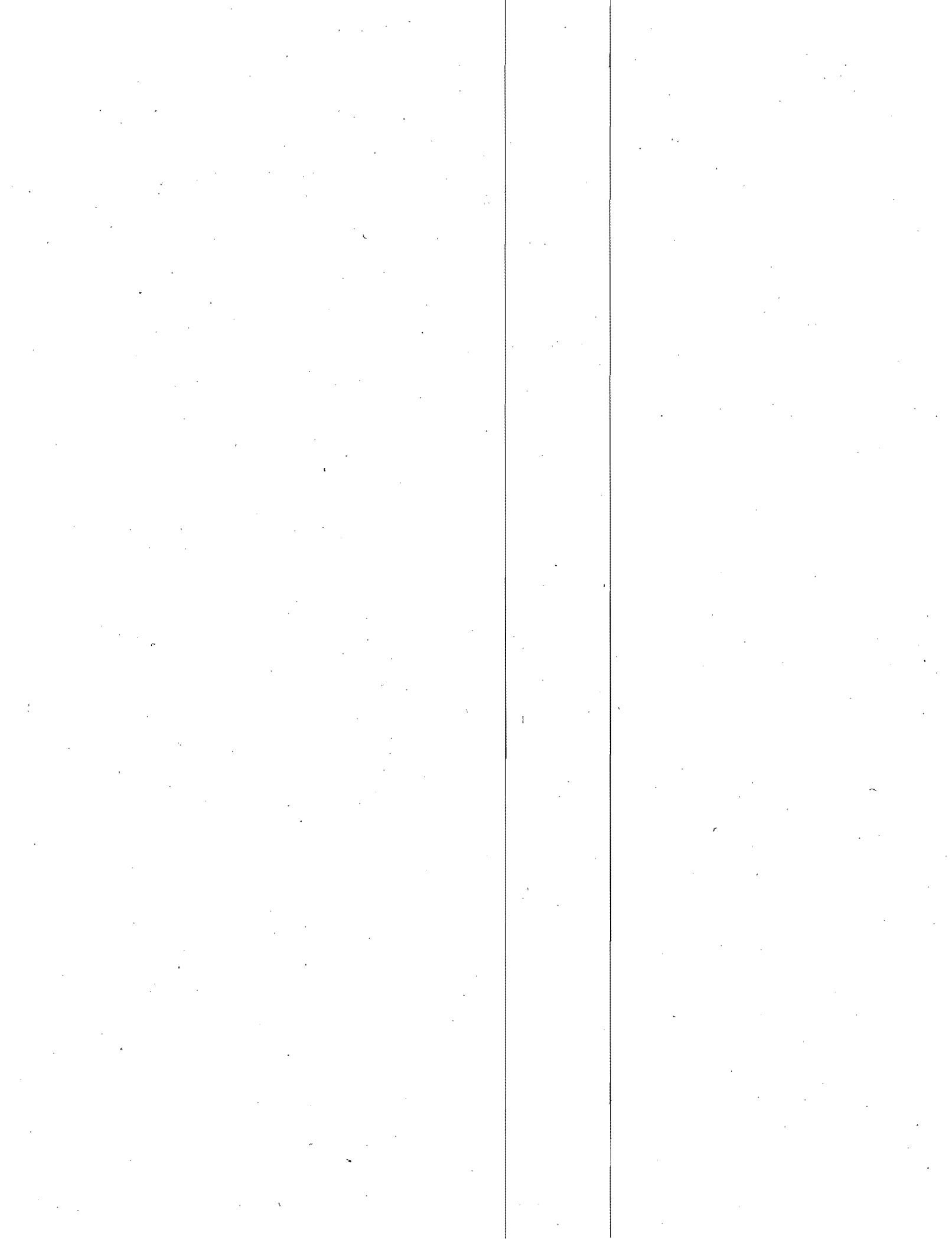
surr-a-Terphenyl 127. 50. - 130.

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Report Approved By: Michael A Lage Report Date: 10/22/99

Theodore J. Duollo, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lage, Technical Services

Laboratory Certification Number: 02008





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ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A157814
Sample ID: OW-15
Sample Type: Water
Site ID: 9-791214

Project: SAM2-2 799453
Project Name:
Sampler: T. CAMPBELL

Date Collected: 10/14/99
Time Collected: 11:07
Date Received: 10/15/99
Time Received: 9:00

Analyst	Result	Units	Report Limit	Quan Limit	Bil Factor	Date	Time	Analyst	Method	Batch
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ORGANIC PARAMETERS

Ext Petroleum Hyd. (EPH)	0.17	ng/l	0.11	0.10	1	10/19/99	20:07	J.Saigasak	TDHE	4051
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ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Extracted	Extract Vol	Wt/Vol	Date	Analyst	Method
EPH	920. ml	1.00 ml		10/18/99	C. Terry	3510

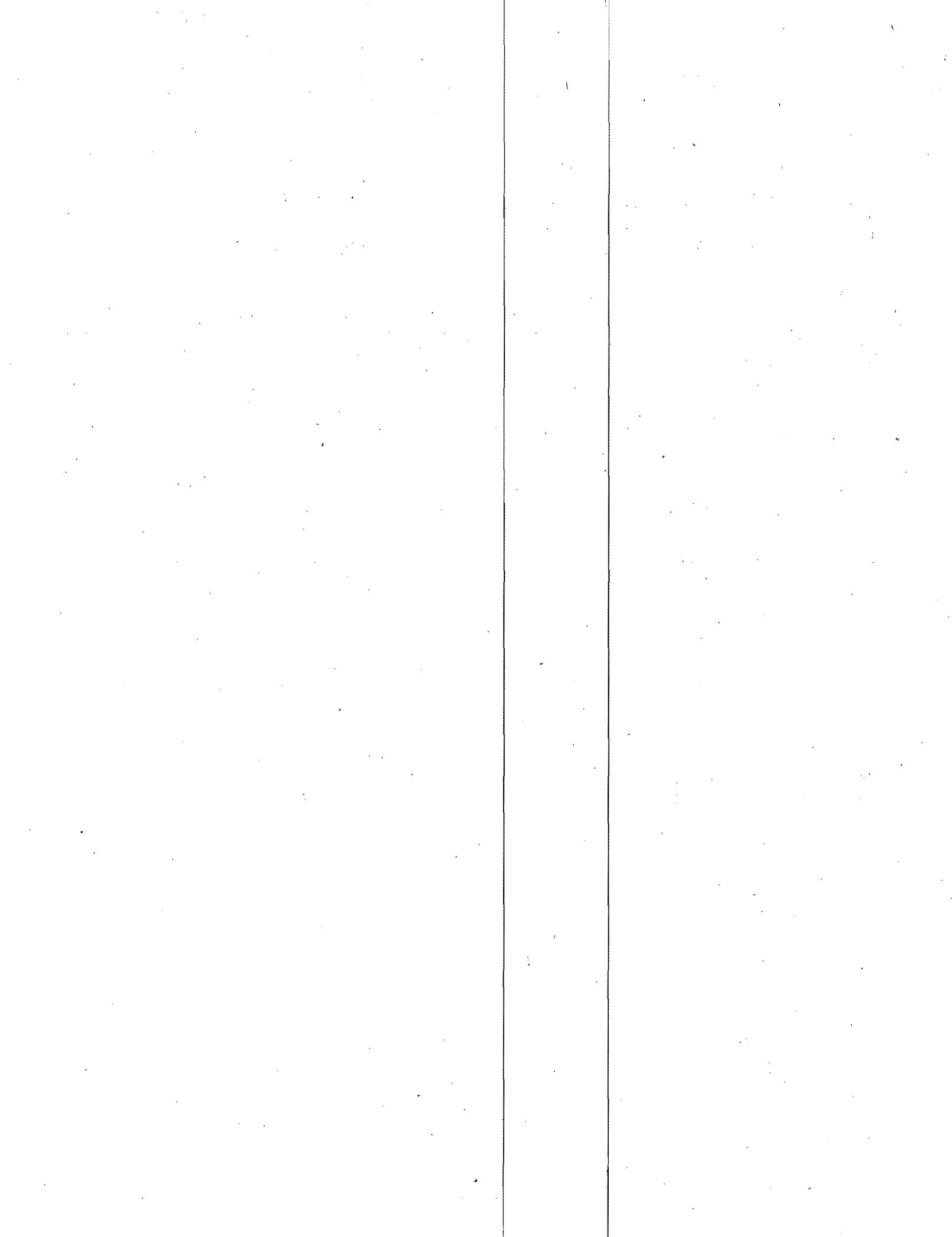
Surrogate	X Recovery	Target Range
surr-o-Terphenyl	112.	50. - 150.

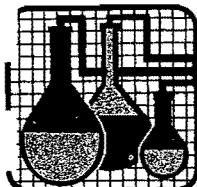
These results relate only to the items tested.
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Report Approved By: Eric A. Smith Report Date: 10/22/99

Theodore J. Duelle, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A. Lange, Technical Services

Laboratory Certification Number: 02008





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ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A157815
Sample ID: OW-40
Sample Type: Water
Site ID: 9-791214

Project: SAM2-2 799453
Project Name:
Sampler: T. CAMPBELL

Date Collected: 10/14/99
Time Collected: 12:05
Date Received: 10/15/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Ruan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
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INORGANIC PARAMETERS

Ext Petroleum Hyd. (EPH)	ND	mg/l	0.11	0.10	1	10/19/99	20:37	J. Saigasak	TDHE	4051
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ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Extracted	Extract Vol	Date	Analyst	Method
EPH	920. mL	1.00 mL	10/18/99	C. Terry	3510

Surrogate	% Recovery	Target Range
surr-o-Terphenyl	132.	50. - 150.

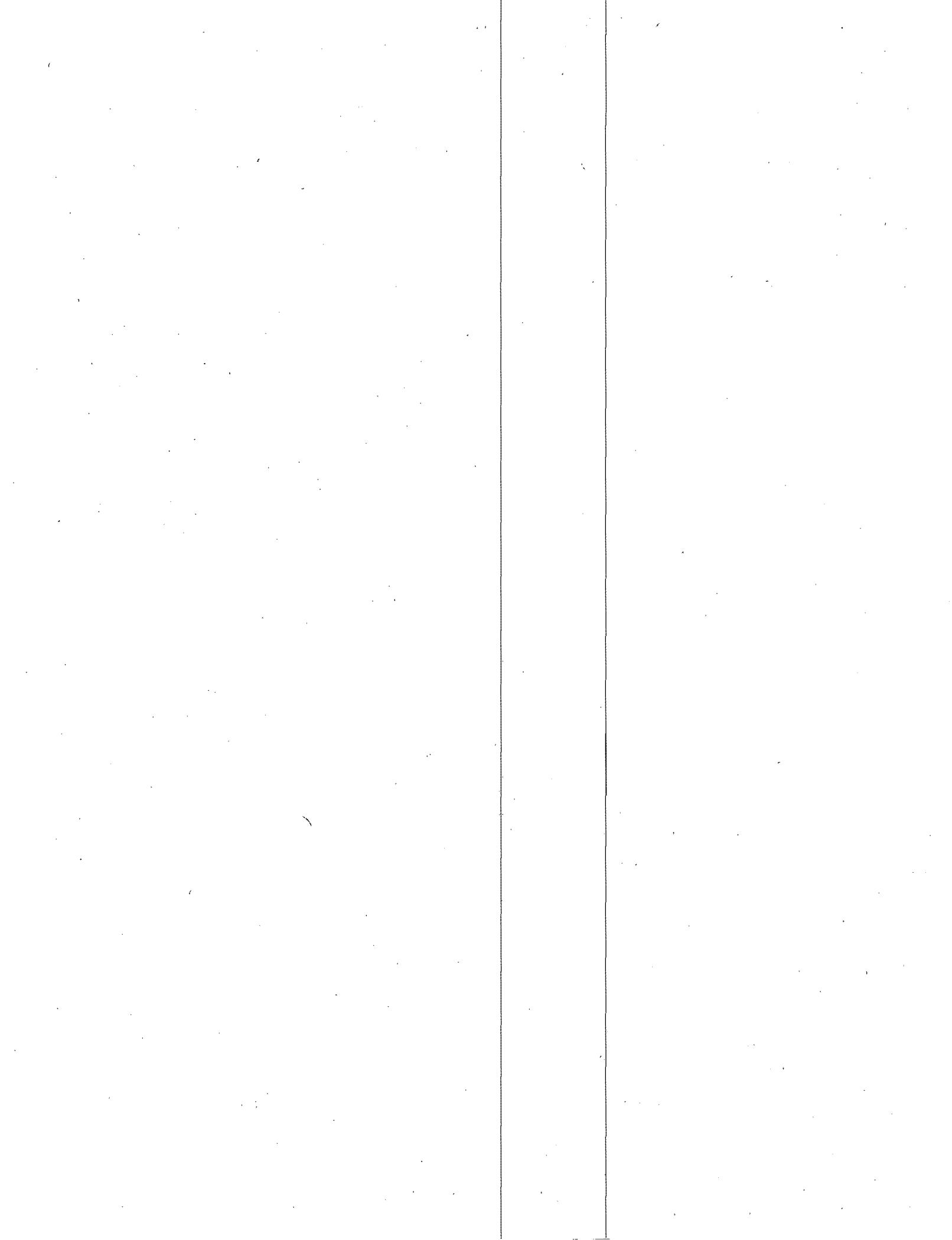
These results relate only to the items tested.
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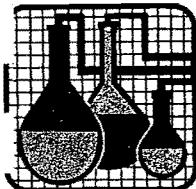
Report Approved By:

Report Date: 10/22/99

Theodore J. Duezzo, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lage, Technical Services

Laboratory Certification Number: 02008





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ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A157816
Sample ID: DW-43
Sample Type: Water
Site ID: 9-791214

Project: SAM2-2 799453
Project Name:
Sampler: T. CAMPBELL

Date Collected: 10/14/99
Time Collected: 10:25
Date Received: 10/15/99
Time Received: 9:00

Analgt	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
ORGANIC PARAMETERS										
Ext Petroleum Hyd. (EPH)	0.37	mg/l	0.10	0.10	1	10/18/99	21:07	J.Salgasak	TDHE	4051

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Extracted	Extract Vol	Date	Analyst	Method
EPH	995. mL	1.00 mL	10/18/99	C. Terry	3510

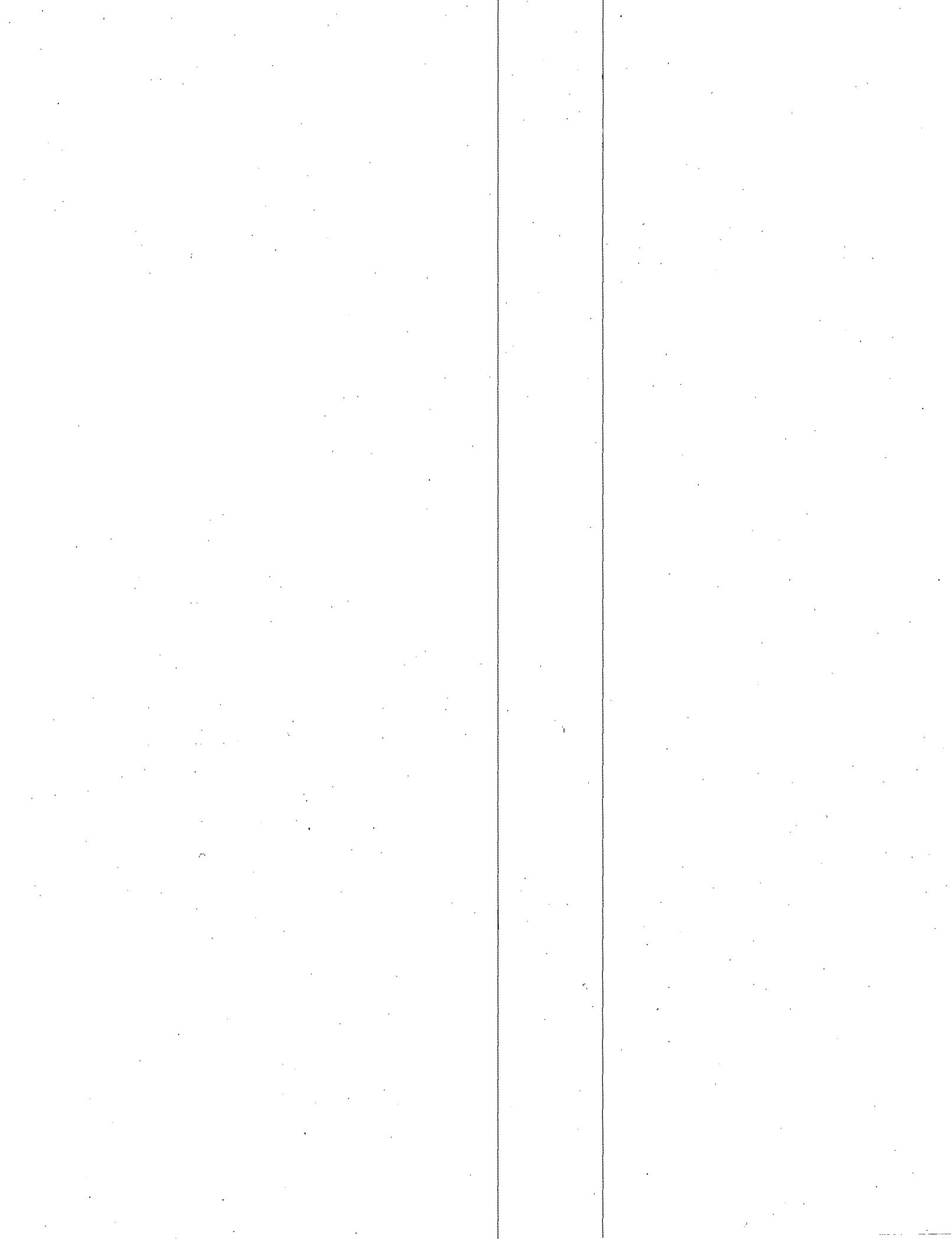
Surrogate	% Recovery	Target Range
corr-o-Terphenyl	95.	50. - 150.

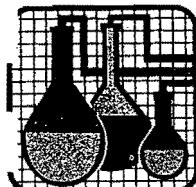
These results relate only to the items tested.
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Report Approved By: Gail A Dugg Report Date: 10/22/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lage, Technical Services

Laboratory Certification Number: 02008





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ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A157B17
Sample ID: MW-1
Sample Type: Water
Site ID: 9-791214

Project: SAM2-2 799453
Project Name:
Sampler: T. CAMPBELL

Date Collected: 10/13/99
Time Collected: 17:33
Date Received: 10/15/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Run Limit	Bil Factor	Date	Time	Analyst	Method	Batch
ORGANIC PARAMETERS										
Ext Petroleum Hyd. (EPH)	0.34	mg/l	0.10	0.10	1	10/13/99	21:37	J. Saigasak	TDHE	4051

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Extracted	Extract Vol	Date	Analyst	Method
EPH	990. mL	1.00 mL	10/13/99	C. Terry	3510

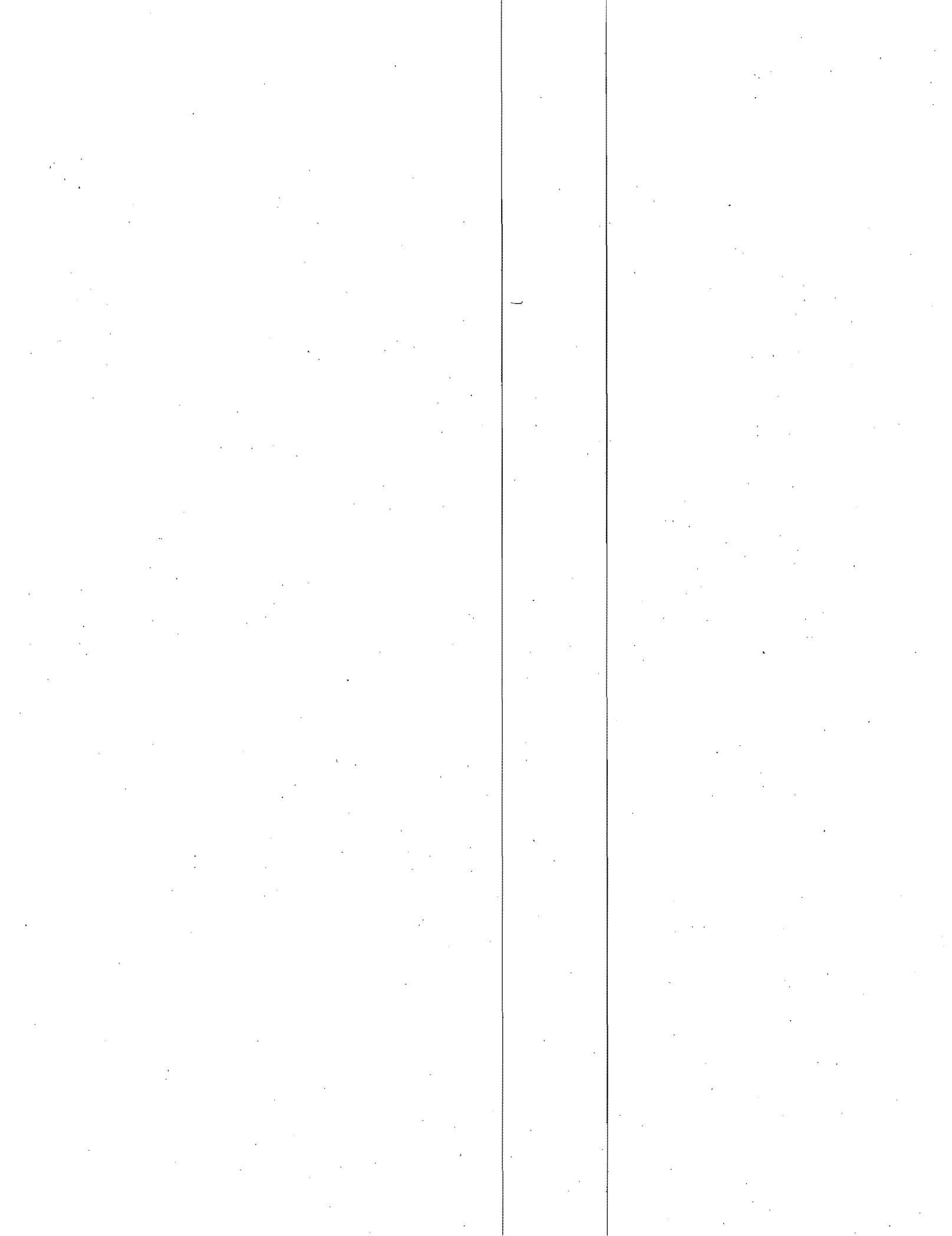
Surrogate	% Recovery	Target Range
surv-a-Terphenyl	93.	50. - 150.

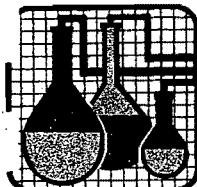
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Report Approved By: Theodore J. Duello Report Date: 10/22/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lage, Technical Services

Laboratory Certification Number: 02008





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ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A157816
Sample ID: OW-32
Sample Type: Water
Site ID: 9-791214

Project: SAM2-2 799453
Project Name:
Sampler: T. CAMPBELL

Date Collected: 10/13/99
Time Collected: 16:48
Date Received: 10/15/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Ruan Limit	Bil Factor	Date	Time	Analyst	Method	Batch
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INORGANIC PARAMETERS

Ext Petroleum Hgd. (EPH) 0.34 mg/l 0.10 0.10 1 10/13/99 22:07 J. Saligasak TDHE 4051

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Extracted	Extract Vol	Date	Analyst	Method
EPH	995. ml	1.00 ml	10/13/99	C. Terry	3510

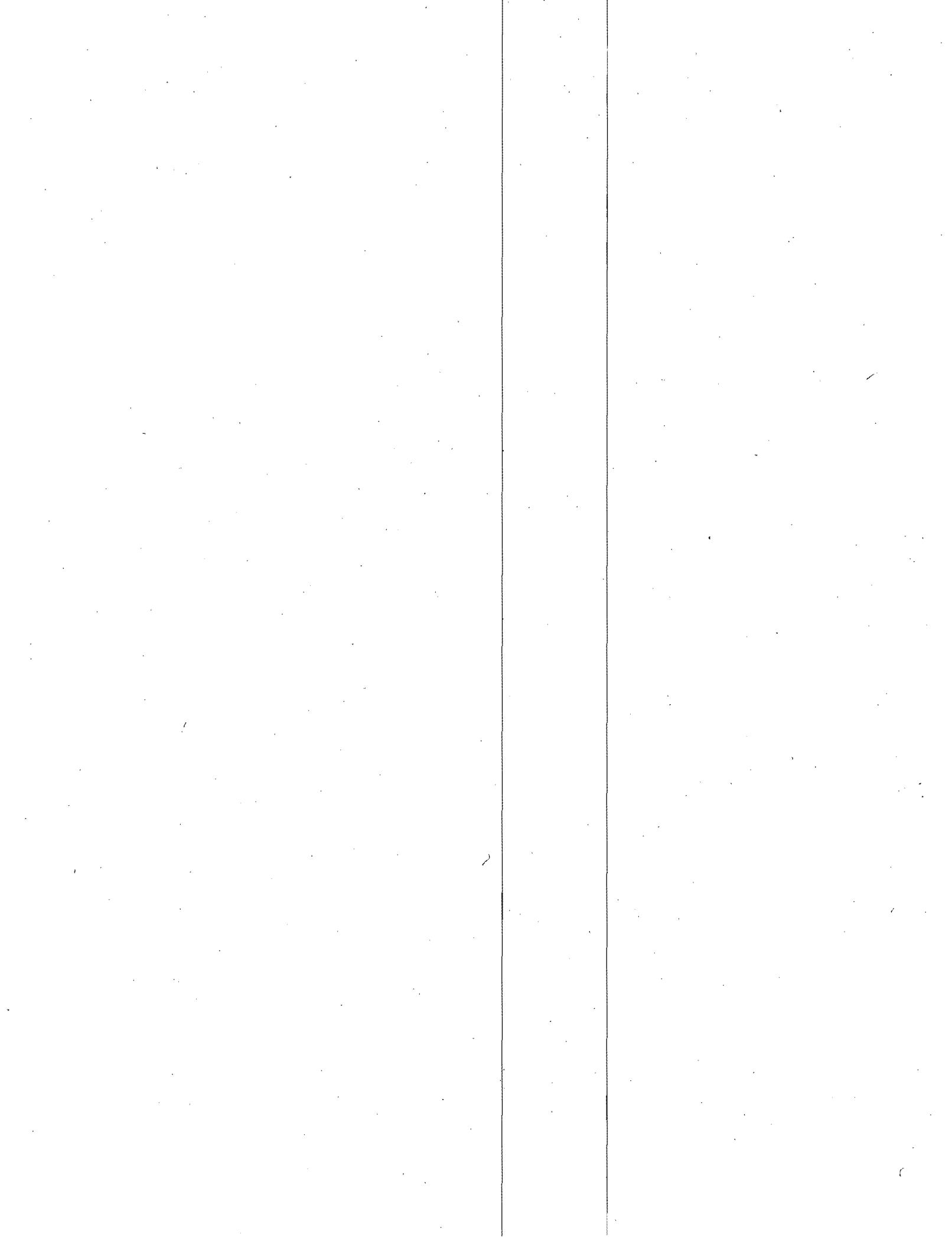
Surrogate	% Recovery	Target Range
c ₁₂ H ₁₀	103.	50. - 150.

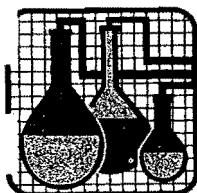
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Report Approved By: Theodore J. Duelle Report Date: 10/22/99

Theodore J. Duelle, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lage, Technical Services

Laboratory Certification Number: 02008





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ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A157819
Sample ID: OW-31
Sample Type: Water
Site ID: 9-791214

Project: SAM2-E 799453
Project Name:
Sampler: T. CAMPBELL

Date Collected: 10/14/99
Time Collected: 14:35
Date Received: 10/15/99
Time Received: 9:00

Analyst	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
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ORGANIC PARAMETERS

Ext Petroleum Hyd. (EPH)	2.04	mg/l	0.10	0.10	1	10/19/99	22:37	J. Saigasak	TDNE	4051
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ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Extracted	Extract Vol	Date	Analyst	Method
EPH	995. ml	1.00 ml	10/18/99	C. Terry	3510

Surrogate	% Recovery	Target Range
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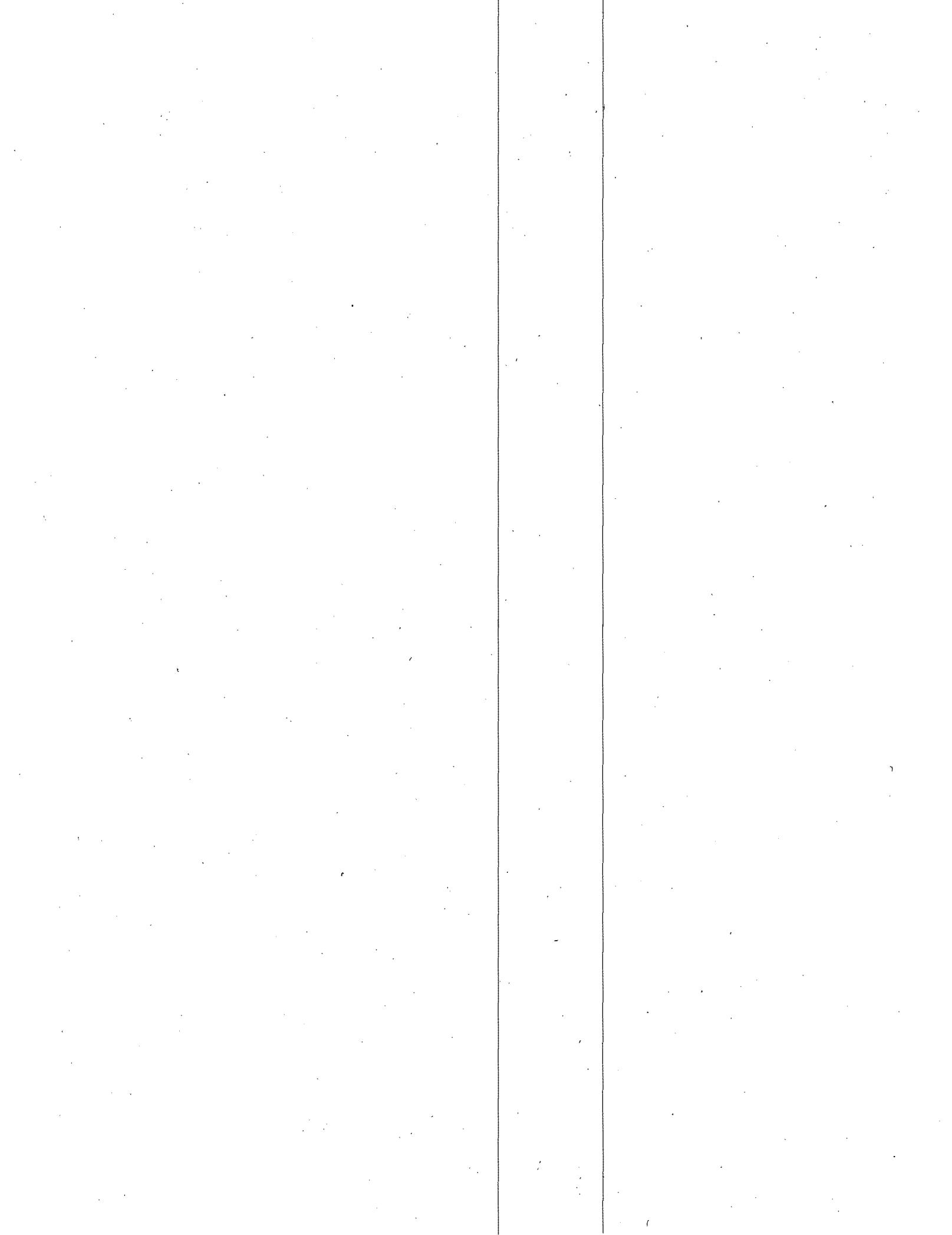
surv-o-Terphenyl	101.	50. - 150.
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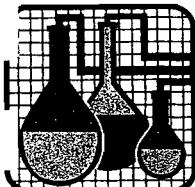
These results relate only to the items tested.
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Report Approved By: Theodore J. Duezzo Report Date: 10/22/99

Theodore J. Duezzo, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A. Lage, Technical Services

Laboratory Certification Number: 02008





SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A157820
Sample ID: OW-30
Sample Type: Water
Site ID: 9-791214

Project: SAM2-2 799453
Project Name:
Sampler: T. CAMPBELL

Date Collected: 10/13/99
Time Collected: 13:18
Date Received: 10/15/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Basis Limit	B/F	Date	Time	Analyst	Method	Batch
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INORGANIC PARAMETERS

Ext Petroleum Hyd. (EPH)	0.31	mg/l	0.10	0.10	1	10/13/99	23:08	J.Saiyasaki	TDHE	4051
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ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Extracted	Extract Vol	Date	Analyst	Method
EPH	995. mL	1.00 mL	10/13/99	C. Terry	3510

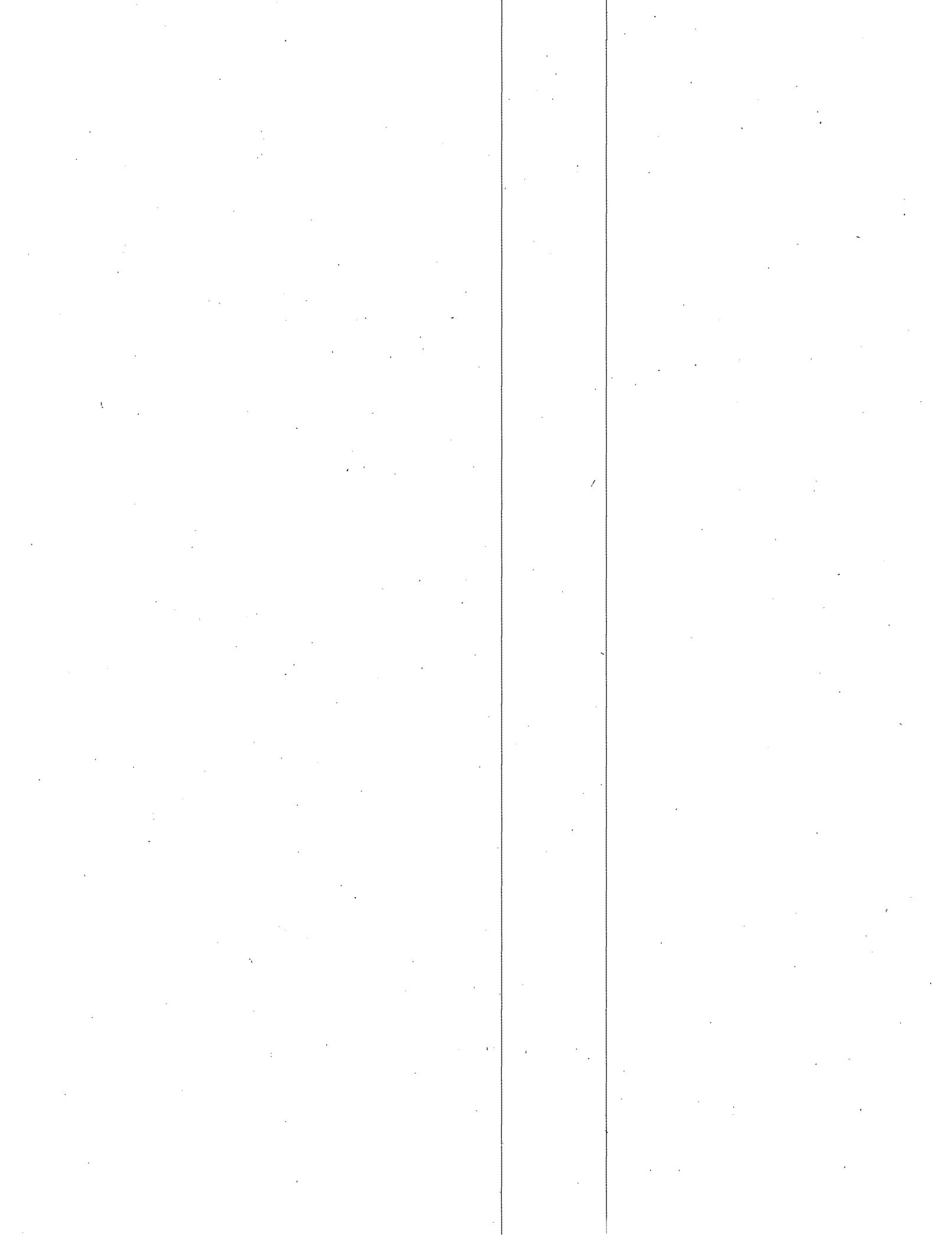
Surrogate	% Recovery	Target Range
surr-o-Terphenyl	107.	50. - 150.

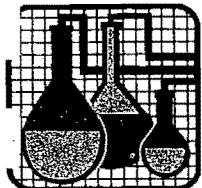
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Report Approved By: Theodore J. Duello Report Date: 10/22/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lage, Technical Services

Laboratory Certification Number: 02008





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P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A157821
Sample ID: OW-29(R)
Sample Type: Water
Site ID: 9-791214

Project: SAM2-2 799453
Project Name:
Sampler: T. CAMPBELL

Date Collected: 10/13/99
Time Collected: 15:45
Date Received: 10/15/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Ruan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
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ORGANIC PARAMETERS

Ext Petroleum Hyd. (EPH) 0.46 mg/l 0.11 0.10 1 10/22/99 5:04 J.Saiyarak TDHE 5737

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Extracted	Extract Vol	Date	Analyst	Method
EPH	940. ml	1.00 ml	10/20/99	Fitzwater	3510

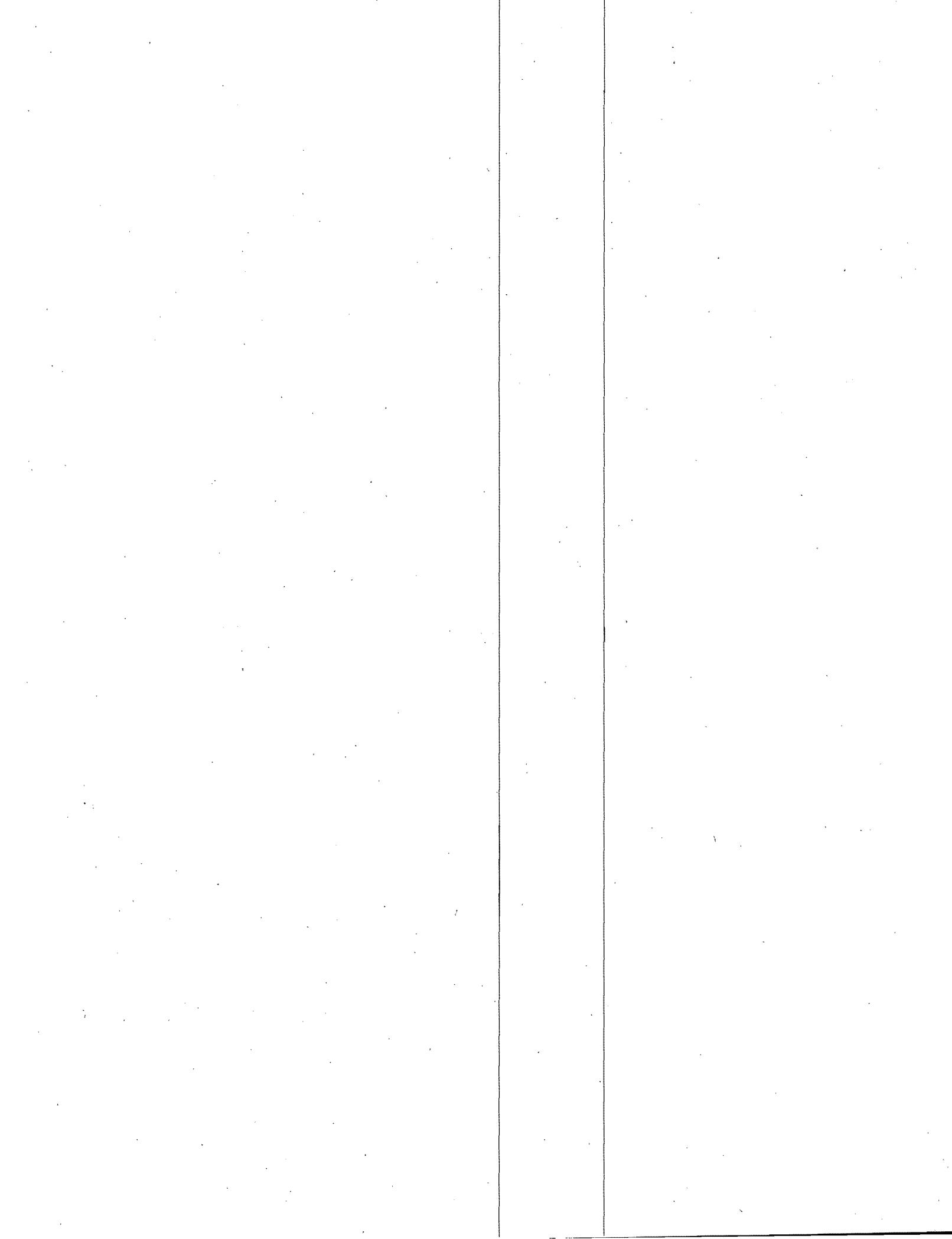
Surrogate	X Recovery	Target Range
surr-o-Terphenyl	123.	50. - 150.

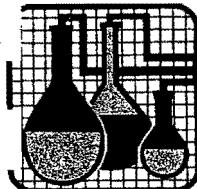
These results relate only to the items tested.
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Report Approved By: Theodore J. Duello Report Date: 10/22/99

Theodore J. Duello, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lage, Technical Services

Laboratory Certification Number: 02008





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Phone 1-615-726-0177

ANALYTICAL REPORT

WILLIAMS REFINING, LLC 7372
JOYCE YEAGER
PO BOX 2930
MEMPHIS, TN 38101-2930

Lab Number: 99-A157822
Sample ID: DW-44
Sample Type: Water
Site ID: 9-791214

Project: SAM2-2 799453
Project Name:
Sampler: T. CAMPBELL

Date Collected: 10/14/99
Time Collected: 13:41
Date Received: 10/15/99
Time Received: 9:00

Analyte	Result	Units	Report Limit	Ruan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
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ORGANIC PARAMETERS

Ext Petroleum Hyd. (EPH) 0.42 mg/l 0.10 0.10 1 10/16/99 0:08 J.Salgasak TDME 4051

ND = Not detected at the report limit.

Sample Extraction Data

Parameter	Wt/Vol	Extracted	Extract Vol	Date	Analyst	Method
EPH	995. ml	1.00 ml	10/16/99	C. Terry	3510	

Surrogate % Recovery Target Range

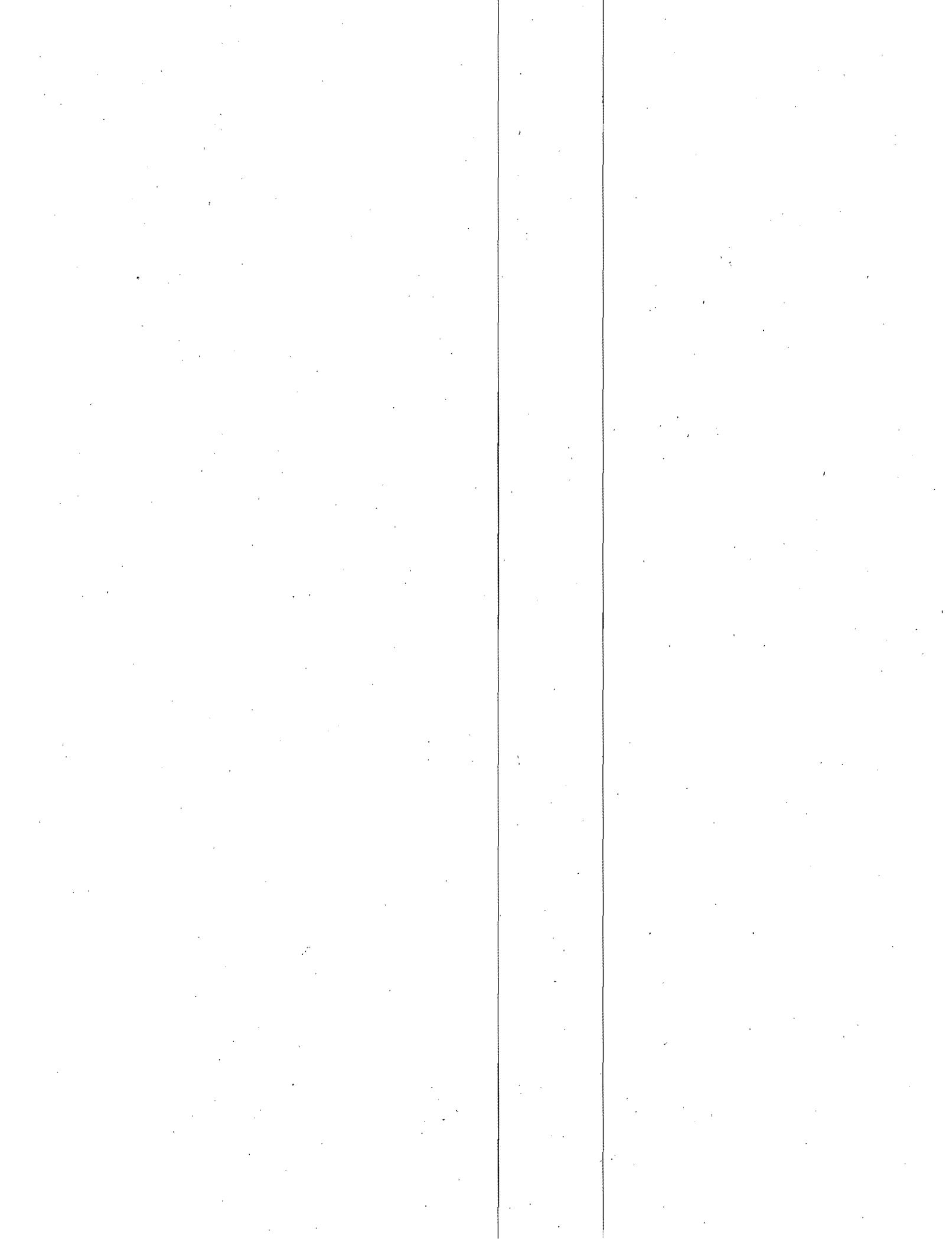
surr-o-Terphengl 71. 50. - 150.

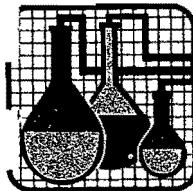
These results relate only to the items tested.
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Report Approved By: Theodore J. Duella Report Date: 10/22/99

Theodore J. Duella, Ph.D., Lab Director
Michael H. Dunn, M.S., Technical Director
Johnny A. Mitchell, Dir. Technical Services
Eric Smith, Assistant Technical Director
Gail A Lase, Technical Services

Laboratory Certification Number: 02008





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2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

PROJECT QUALITY CONTROL DATA

Matrix Spike Recovery

Analyte	units	Orig. Val.	MS Val.	Spike Conc	Recovery	Target Range	R.C. Batch
Ext Petroleum Hyd. (EPH)	ng/l	< 0.10	0.85	1.00	85	56. - 126.	4051
Ext Petroleum Hyd. (EPH)	ng/l	< 0.10	0.88	1.00	88	56. - 126.	5737

Matrix Spike Duplicate

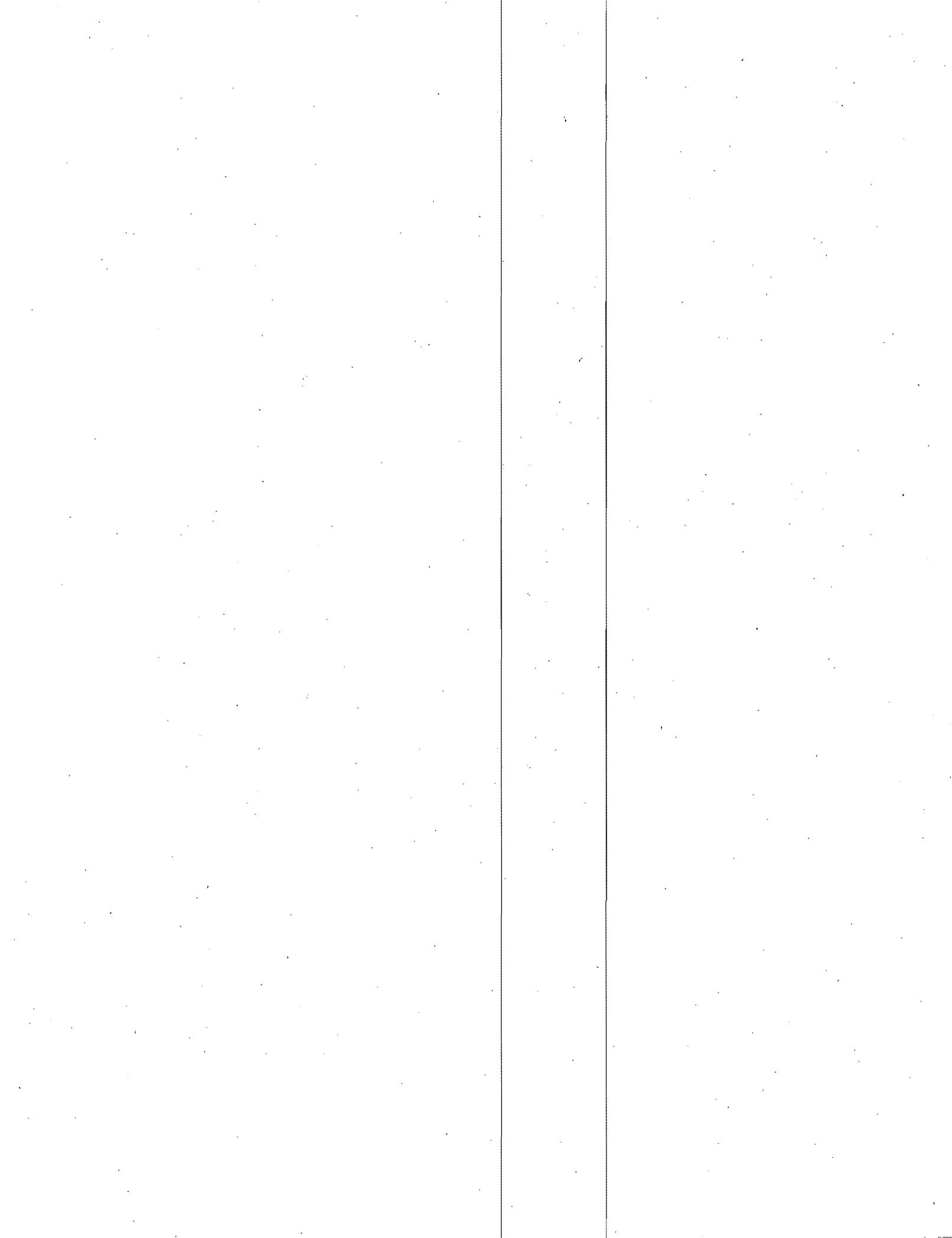
Analyte	units	Orig. Val.	Duplicate	RPD	Limit	R.C. Batch
Ext Petroleum Hyd. (EPH)	ng/l	0.85	0.74	13.84	29.	4051
Ext Petroleum Hyd. (EPH)	ng/l	0.88	1.09	21.32	29.	5737

Laboratory Control Data

Analyte	units	Known Val.	Analyzed Val	% Recovery	Target Range	R.C. Batch
Ext Petroleum Hyd. (EPH)	ng/l	1.00	0.83	83	60 - 140	4051
Ext Petroleum Hyd. (EPH)	ng/l	1.00	0.93	93	60 - 140	5737

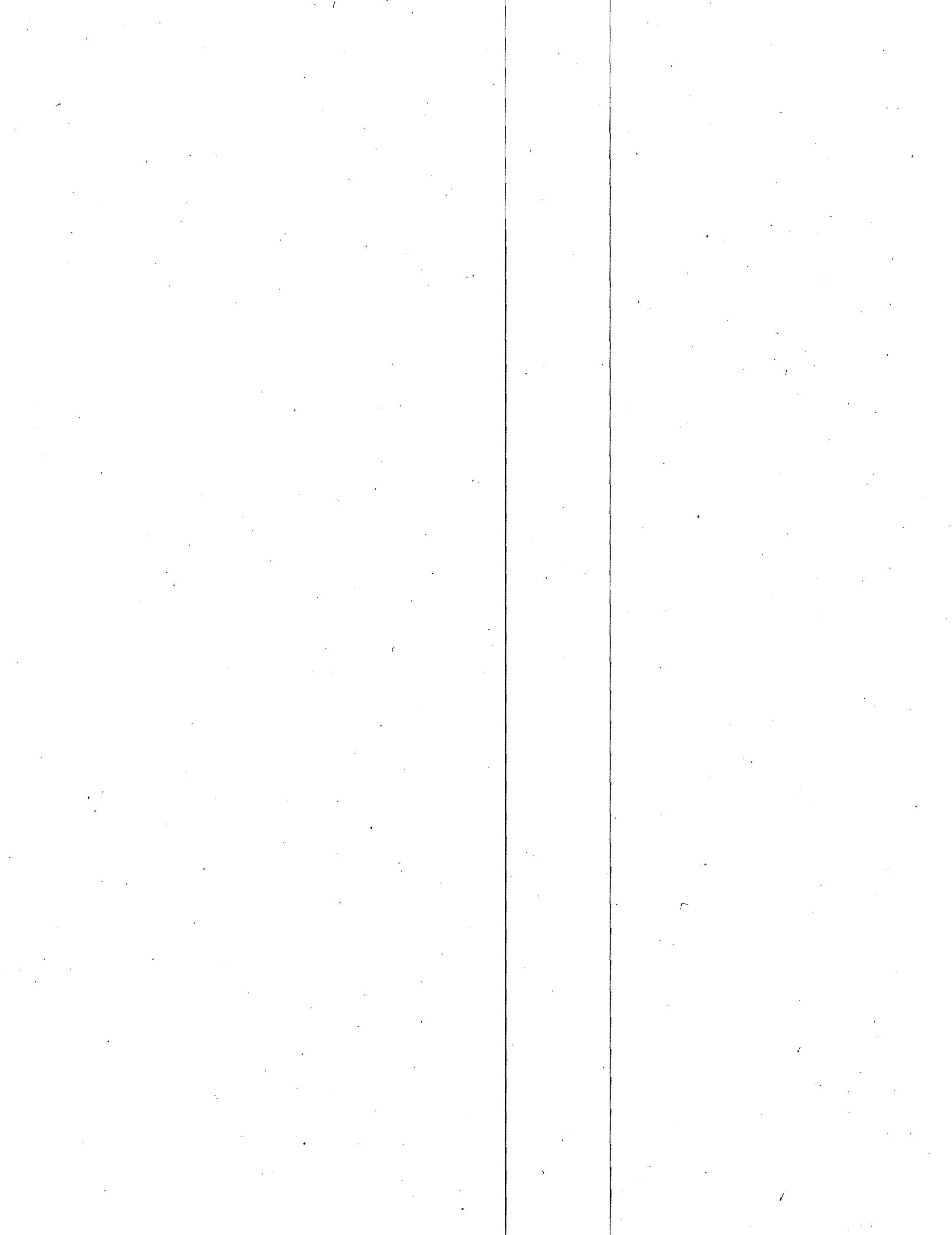
Blank Data

Analyte	Blank Value	Units	R.C. Batch
Ext Petroleum Hyd. (EPH)	< 0.10	ng/l	4051
Ext Petroleum Hyd. (EPH)	< 0.10	ng/l	5737



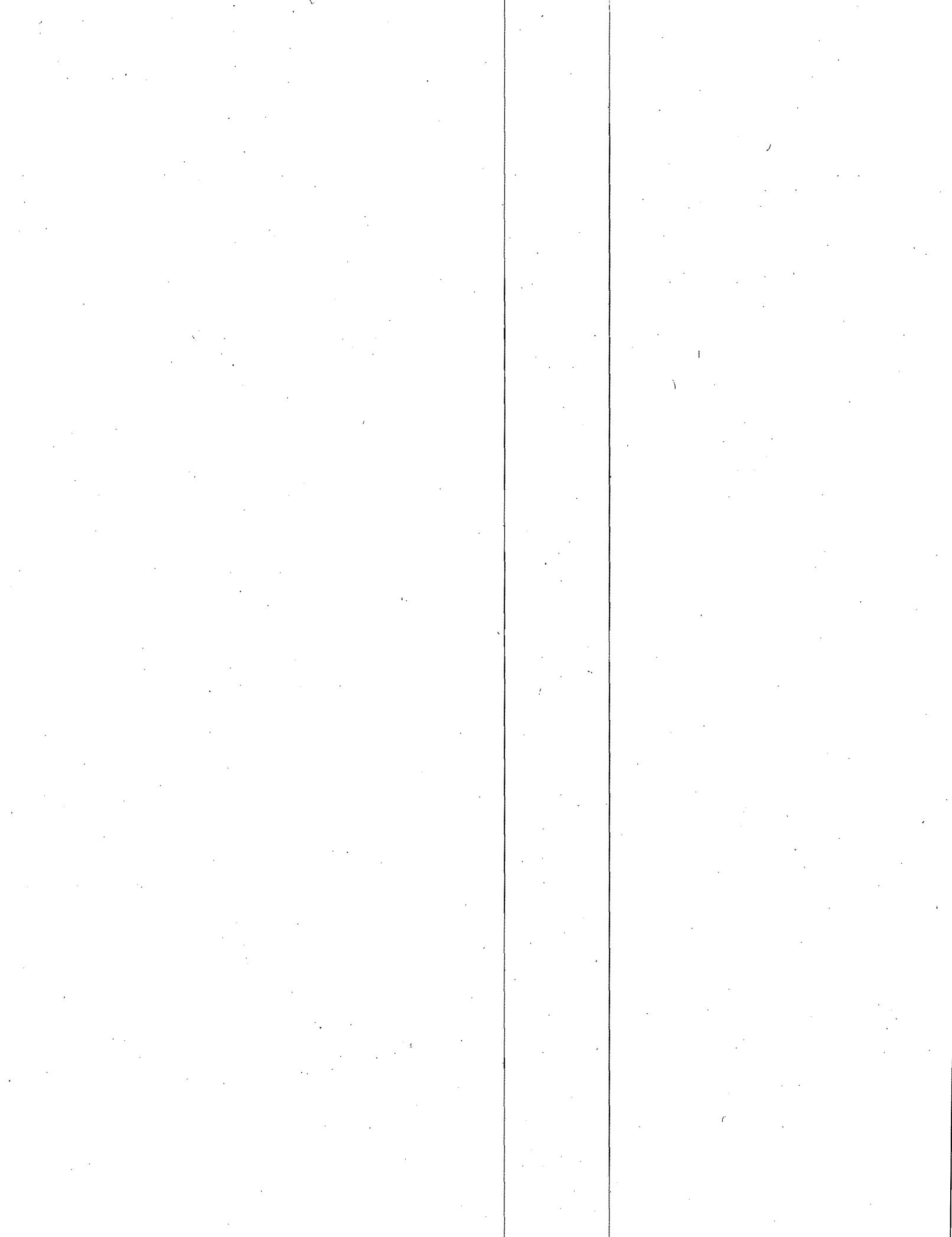
APPENDIX

D



APPENDIX D

HISTORICAL GROUNDWATER ELEVATIONS AND APPARENT FREE PRODUCT THICKNESSES AND GRAPHS



APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:	Measurements in Feet			
		Top of Casing Elevation	219.92	PSH S.G.	0.7788
		Depth to Screen	not available		Measured 10/99
B-1		Well Depth	31.00		
10/20/97		40.37	40.57	0.20	179.51
11/03/97		ND	38.63	ND	181.29
11/25/97		41.97	42.08	0.11	177.93
12/12/97		39.63	40.40	0.77	180.12
12/29/97		39.06	39.53	0.47	180.76
01/12/98		38.91	39.42	0.51	180.90
01/27/98		20.54	20.99	0.45	199.28
02/10/98		23.91	24.50	0.59	195.88
02/24/98		19.60	20.02	0.42	200.23
03/12/98		20.32	20.76	0.44	199.50
03/25/98		17.72	17.85	0.13	202.17
04/13/98		15.78	16.12	0.34	204.06
04/28/98		11.32	11.70	0.38	208.52
05/15/98		9.62	9.94	0.32	210.23
05/22/98		9.92	10.27	0.35	209.92
06/08/98		17.53	17.63	0.10	202.37
06/22/98		16.12	16.30	0.18	203.76
07/06/98		15.05	15.30	0.25	204.81
07/23/98		16.93	17.05	0.12	202.96
08/11/98		19.70	20.04	0.34	200.14
08/24/98		20.56	20.91	0.35	199.28
09/08/98		23.19	23.66	0.47	196.63
09/14/98		24.24	24.74	0.50	195.57
09/22/98		25.29	25.81	0.52	194.51
10/05/98		27.28	27.79	0.51	192.53
10/19/98		28.30	28.78	0.48	191.51
11/13/98		NG	NG	NG	
11/23/98		27.92	28.48	0.56	191.88
12/07/98		28.28	28.90	0.62	191.50
12/21/98		28.25	28.90	0.65	191.53
01/05/99		28.27	28.78	0.51	191.54
01/18/99		26.08	26.60	0.52	193.72
01/25/99		22.60	23.08	0.48	197.21
02/08/99		15.48	16.23	0.75	204.27
02/22/99		15.08	16.11	1.03	204.61
03/08/99		18.15	18.97	0.82	201.59
03/29/99		15.72	16.57	0.85	204.01
04/13/99		19.25	20.50	1.25	200.39
04/26/99		ND	17.10	ND	202.82
05/10/99		15.12	15.28	0.16	204.76
05/24/99		16.62	16.70	0.08	203.28
06/07/99		19.00	19.23	0.23	200.87
06/30/99		20.15	20.53	0.38	199.69
07/11/99		19.30	19.75	0.45	200.52
07/26/99		21.83	22.46	0.63	197.95
08/09/99		23.40	24.24	0.84	196.33
08/23/99		24.37	25.28	0.91	195.35
09/07/99		26.96	27.88	0.92	192.76
09/27/99		28.85	29.72	0.87	190.88
10/26/99		30.00	30.80	0.80	189.74
11/08/99		30.25	30.93	0.68	189.52
11/22/99		30.76	31.00	0.24	189.11
12/07/99		ND	31.00	ND	188.92

Notes:

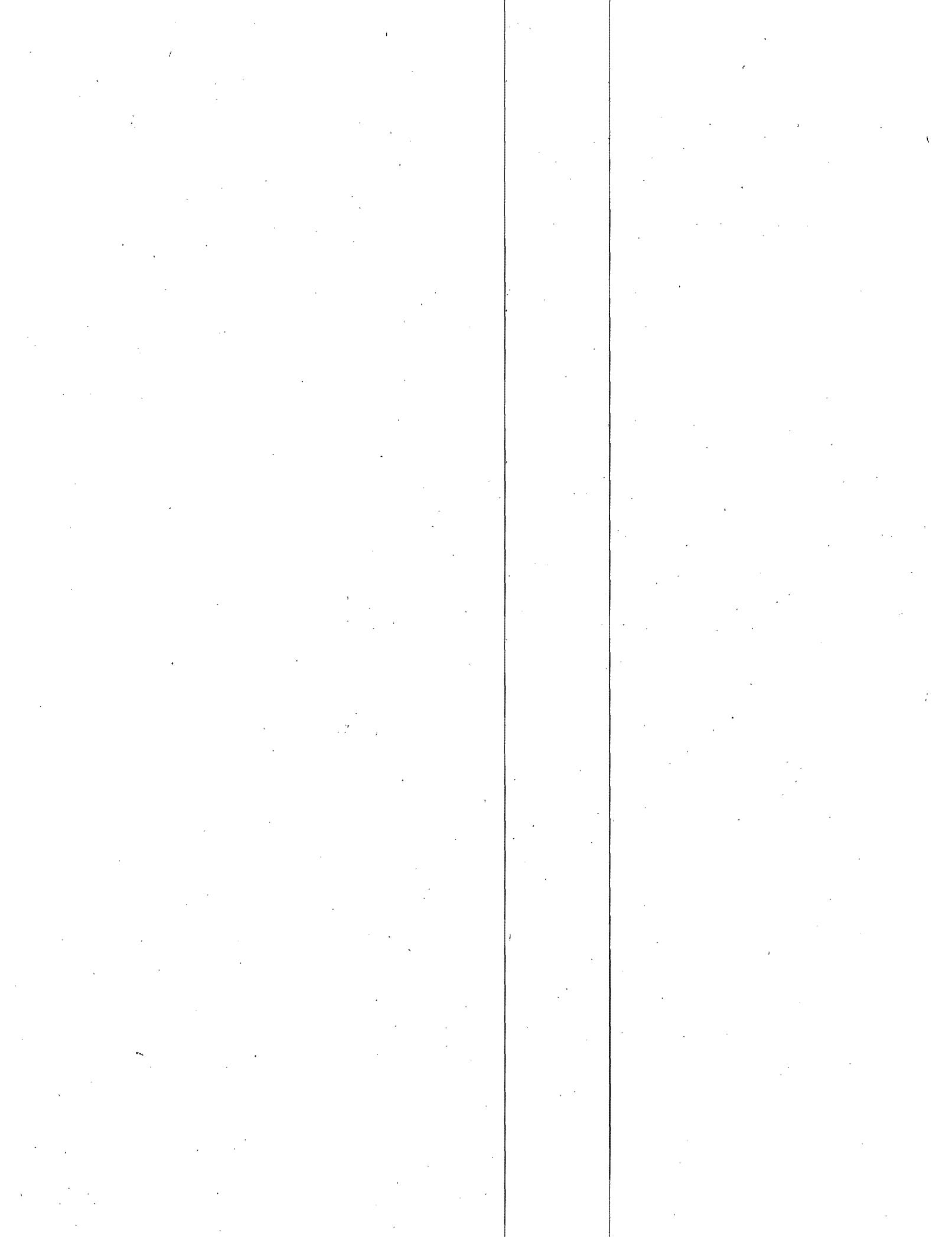
PSH = Phase separated hydrocarbons

ND = Not detected

NG = Not gauged

Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

$$\text{Potentiometric Surface Elevation} = \text{Top of Casing Elevation} - \text{Depth to Water} + (\text{Specific Gravity of PSH} \times \text{PSH Thickness})$$



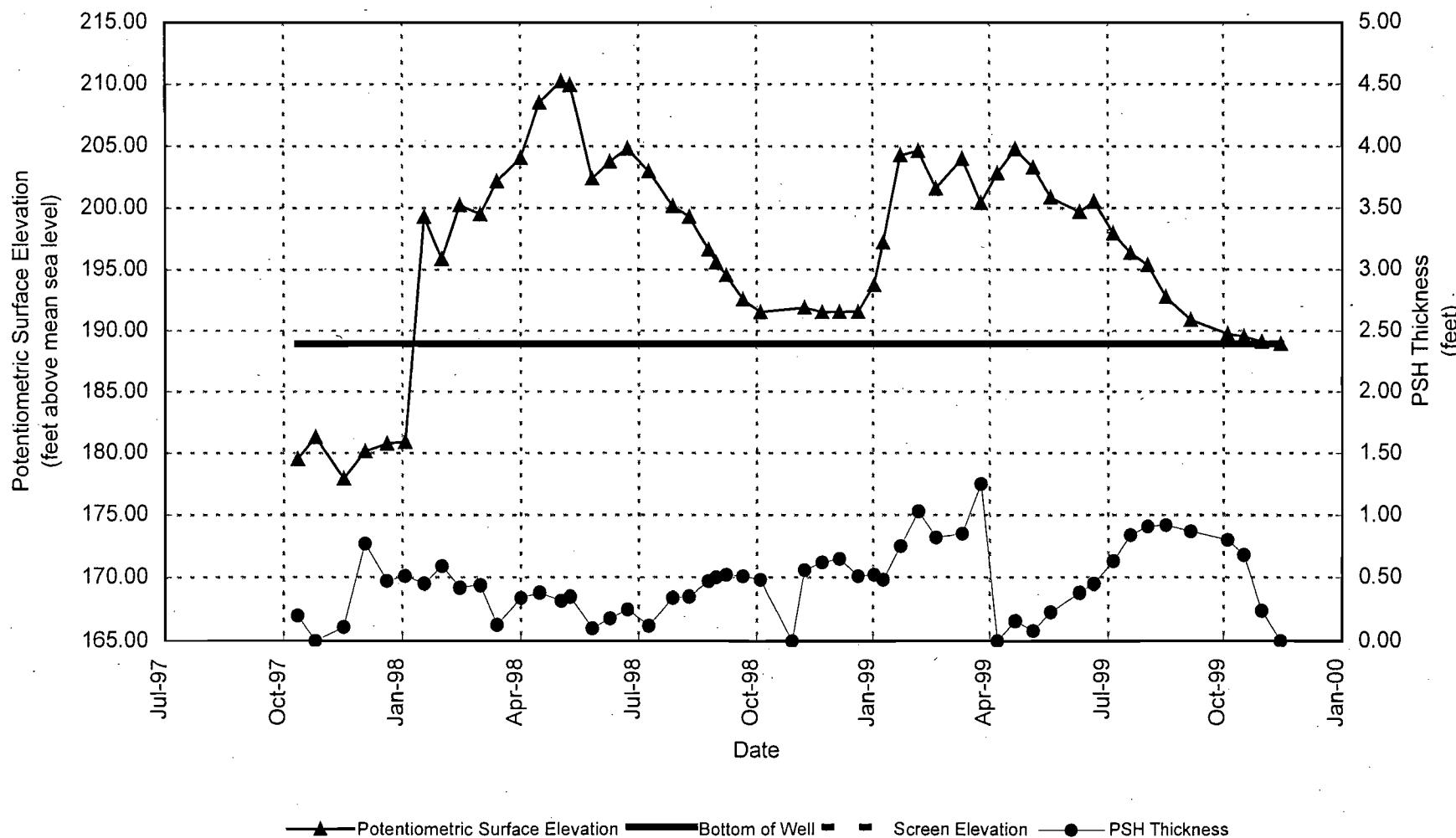
MONITORING DATA VS. TIME

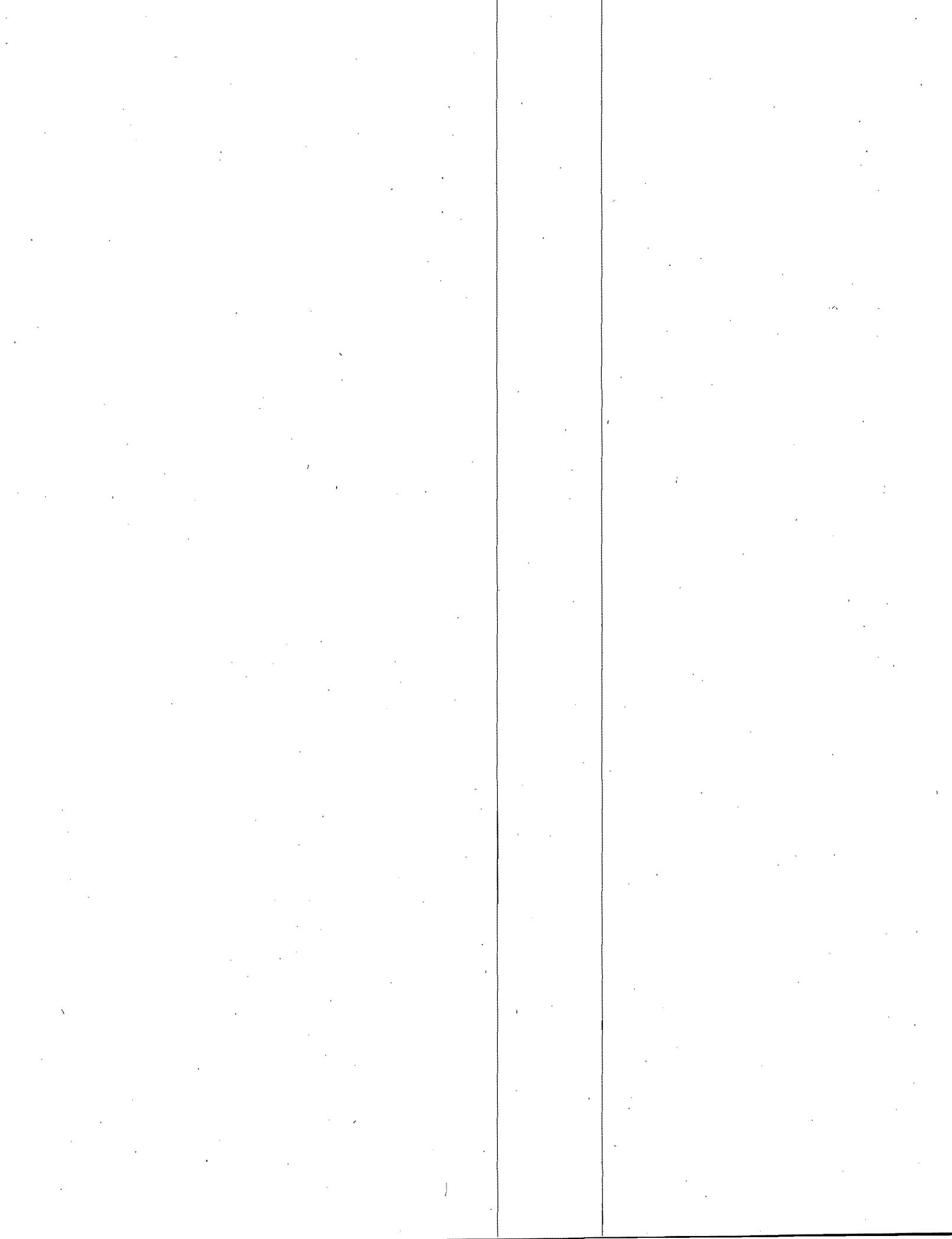
B-1

WILLIAMS REFINING, L.L.C.

543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE

TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:	Top of Casing Elevation Depth to Screen Well Depth	219.72 not available 42.00	PSH S.G. 0.7788	Assumed, based on S.G. of LNAPL measured in B-1 (10/99)
Monitoring Date	Notes	Measurements in Feet			
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
10/21/97		34.22	36.03	1.81	185.10
11/03/97		35.50	36.29	0.79	184.05
11/24/97		29.67	30.59	0.92	189.85
12/12/97		27.63	28.24	0.61	191.96
12/29/97		26.49	27.29	0.80	193.05
01/12/98		25.78	26.67	0.89	193.74
01/27/98		18.55	25.72	7.17	199.58
02/10/98		22.67	25.48	2.81	196.43
02/24/98		17.13	24.71	7.58	200.91
03/12/98		18.15	25.80	7.65	199.88
03/24/98		15.45	25.14	9.69	202.13
04/13/98		14.71	21.11	6.40	203.59
04/28/98		10.83	11.97	1.14	208.64
05/15/98		10.08	11.45	1.37	209.34
05/21/98		10.69	12.18	1.49	208.70
06/08/98		18.62	18.96	0.34	201.02
06/22/98		15.28	19.22	3.94	203.57
07/06/98		14.78	15.87	1.09	204.70
07/23/98		16.93	17.73	0.80	202.61
08/11/98		19.90	20.58	0.68	199.67
08/24/98		20.80	22.62	1.82	198.52
09/08/98		24.63	24.77	0.14	195.06
09/14/98		25.88	26.04	0.16	193.80
09/22/98	ND	26.65	ND	ND	193.07
10/05/98		27.47	27.80	0.33	192.18
10/19/98		27.22	27.28	0.06	192.49
11/13/98		27.45	27.50	0.05	192.26
11/23/98		26.58	26.65	0.07	193.12
12/07/98		27.62	27.72	0.10	192.08
12/21/98		28.55	28.65	0.10	191.15
01/05/99		28.10	28.28	0.18	191.58
01/18/99		24.88	24.95	0.07	194.82
01/25/99		21.00	21.72	0.72	198.56
02/08/99		13.92	14.41	0.49	205.69
02/22/99		14.61	15.48	0.87	204.92
03/08/99		17.29	18.40	1.11	202.18
03/29/99		15.33	16.93	1.60	204.04
04/13/99		19.10	20.45	1.35	200.32
04/26/99		15.90	16.78	0.88	203.63
05/10/99		15.43	16.39	0.96	204.08
05/24/99		17.39	19.94	2.55	201.77
06/07/99		19.14	19.56	0.42	200.49
06/30/99		20.70	21.85	1.15	198.77
07/11/99		18.83	22.23	3.40	200.14
07/26/99		22.40	23.00	0.60	197.19
08/09/99		23.60	24.62	1.02	195.89
08/23/99		25.08	25.23	0.15	194.61
09/07/99		26.82	27.88	1.06	192.67
09/27/99		29.12	29.29	0.17	190.56
10/26/99		29.35	29.45	0.10	190.35
11/08/99		30.12	30.22	0.10	189.58
11/22/99		ND	30.13	ND	189.59
12/07/99		ND	30.30	ND	189.42

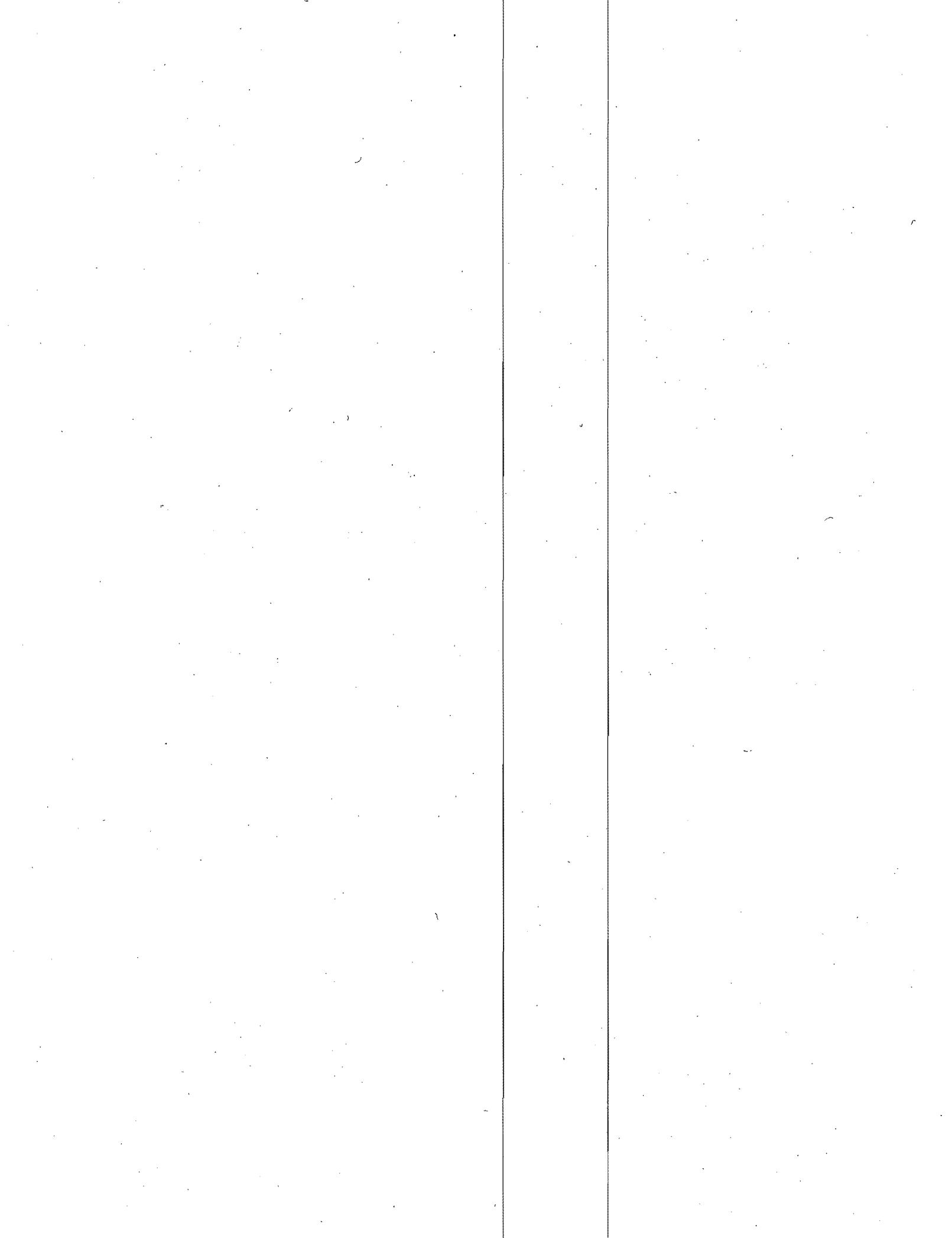
Notes:

PSH = Phase separated hydrocarbons

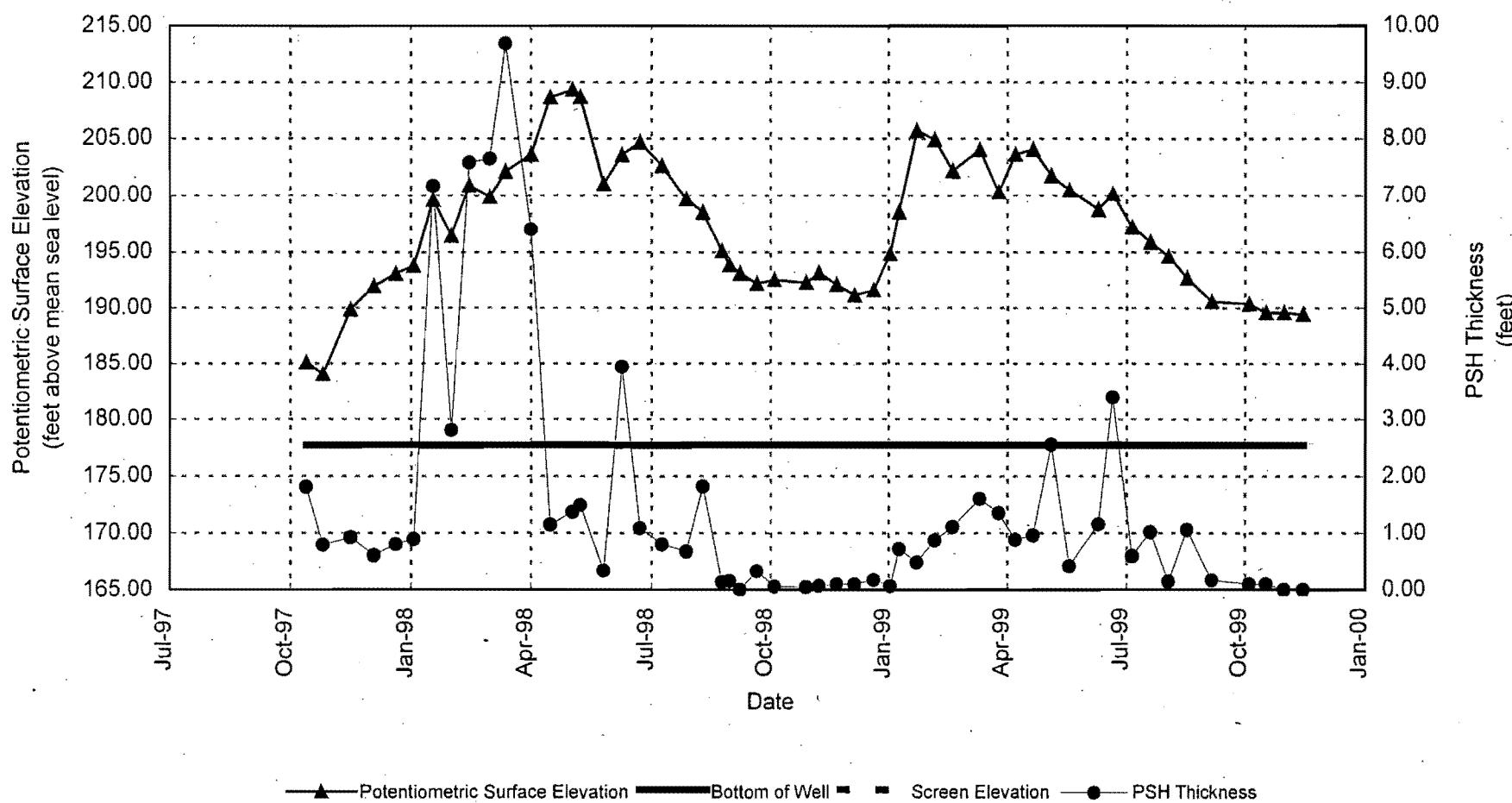
ND = Not detected NG = Not gauged

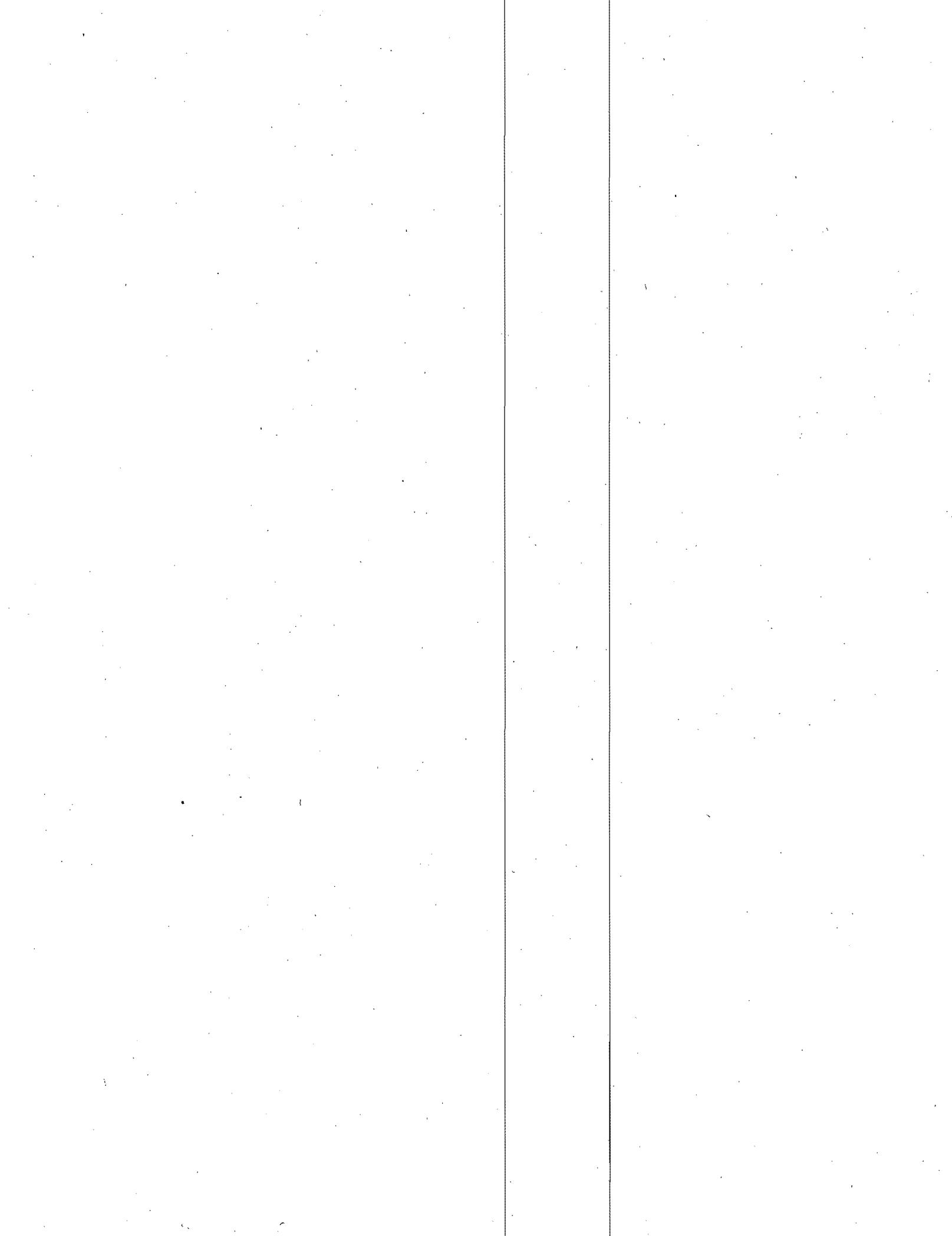
Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

$$\text{Potentiometric Surface Elevation} = \text{Top of Casing Elevation} - \text{Depth to Water} + (\text{Specific Gravity of PSH} \times \text{PSH Thickness})$$



MONITORING DATA VS. TIME
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WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE
TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:	Measurements in Feet			
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
		Top of Casing Elevation B-5	223.01 not available	PSH S.G. 0.7788	Assumed, based on S.G. of LNAPL measured in B-1 (10/99)
10/21/97		32.68	33.38	0.70	190.18
11/03/97		31.67	32.44	0.77	191.17
11/24/97		32.93	33.80	0.87	189.89
12/12/97		31.60	32.18	0.58	191.28
12/29/97		30.32	30.65	0.33	192.62
01/12/98		29.72	32.05	2.33	192.77
01/27/98		23.65	23.80	0.15	199.33
02/10/98		26.70	27.02	0.32	196.24
02/24/98		21.58	22.20	0.62	201.29
03/12/98		22.68	23.42	0.74	200.17
03/24/98		20.28	21.25	0.97	202.52
04/13/98		19.03	19.70	0.67	203.83
04/28/98		14.13	14.78	0.65	208.74
05/15/98		13.15	13.84	0.69	209.71
05/21/98		13.84	14.55	0.71	209.01
06/08/98		21.72	22.66	0.94	201.08
06/22/98		18.98	19.23	0.25	203.97
07/06/98		17.90	18.25	0.35	205.03
07/23/98		20.78	21.39	0.61	202.10
08/11/98		22.62	23.42	0.80	200.21
08/24/98		24.52	25.47	0.95	198.28
09/08/98		ND	27.67	ND	195.34
09/14/98		29.09	31.03	1.94	193.49
09/22/98		29.68	32.03	2.35	192.81
10/05/98		30.68	30.77	0.09	192.31
10/19/98		30.42	30.55	0.13	192.56
11/13/98		NG	NG	NG	
11/23/98		ND	29.94	ND	193.07
12/07/98		30.50	30.55	0.05	192.50
12/21/98		34.14	34.17	0.03	188.86
01/05/99		31.01	32.33	1.32	191.71
01/18/99		ND	28.00	ND	195.01
01/25/99		ND	24.06	ND	198.95
02/08/99		ND	16.97	ND	206.04
02/22/99		18.13	18.35	0.22	204.83
03/08/99		21.01	21.65	0.64	201.86
03/29/99		18.56	19.42	0.86	204.26
04/13/99		22.38	23.36	0.98	200.41
04/26/99		18.75	19.23	0.48	204.15
05/10/99		17.90	18.70	0.80	204.93
05/24/99		20.72	21.71	0.99	202.07
06/07/99		22.50	22.90	0.40	200.42
06/30/99		24.08	24.72	0.64	198.79
07/11/99		22.87	23.62	0.75	199.97
07/26/99		26.13	26.90	0.77	196.71
08/09/99		27.60	27.90	0.30	195.34
08/23/99		28.95	29.35	0.40	193.97
09/07/99		30.55	30.97	0.42	192.37
09/27/99		32.55	33.05	0.50	190.35
10/26/99		32.93	33.45	0.52	189.96
11/08/99		33.50	34.05	0.55	189.39
11/22/99		33.56	34.10	0.54	189.33
12/07/99		33.75	34.29	0.54	189.14

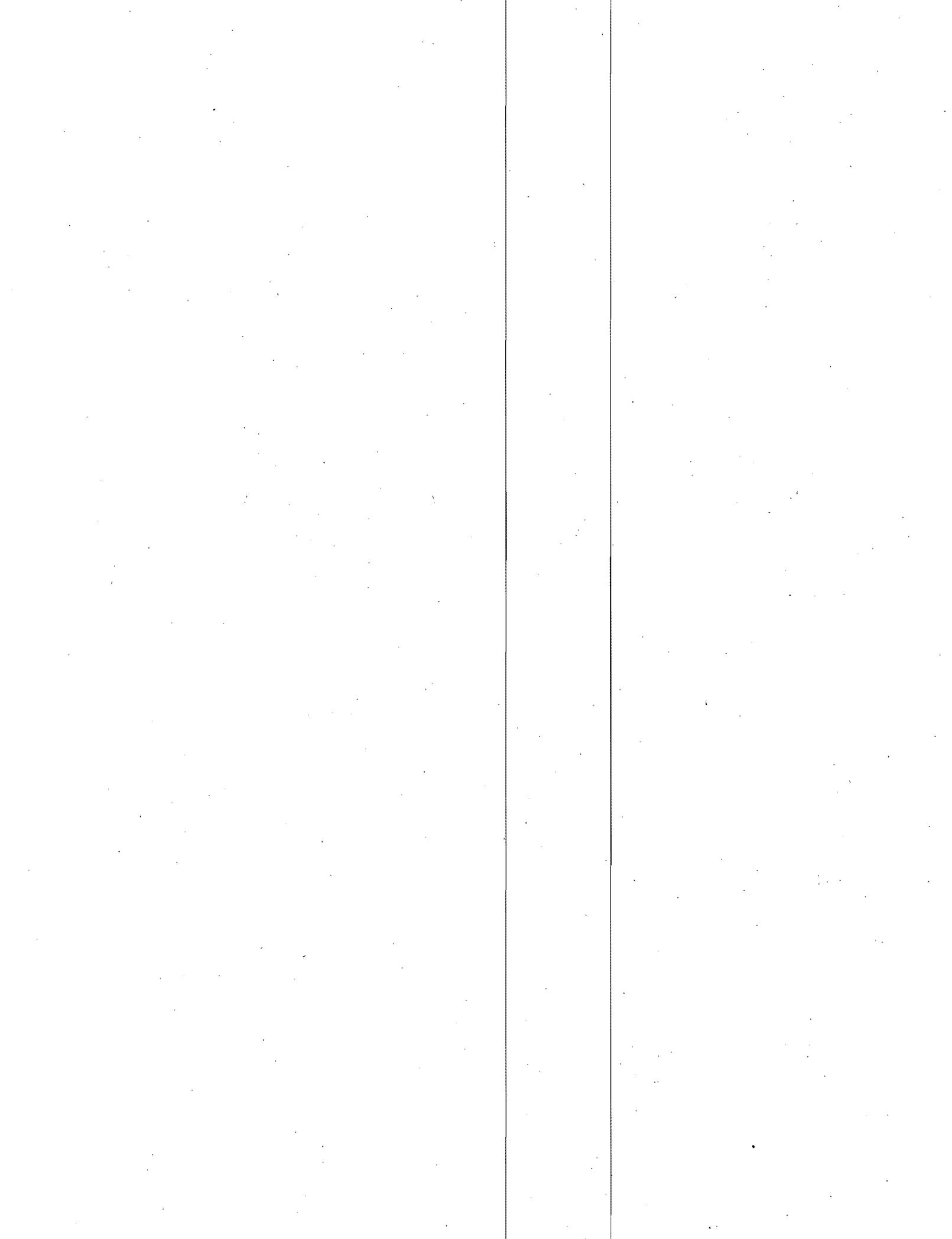
Notes:

PSH = Phase separated hydrocarbons

ND = Not detected NG = Not gauged

Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

Potentiometric Surface Elevation = Top of Casing Elevation - Depth to Water + (Specific Gravity of PSH x PSH Thickness)



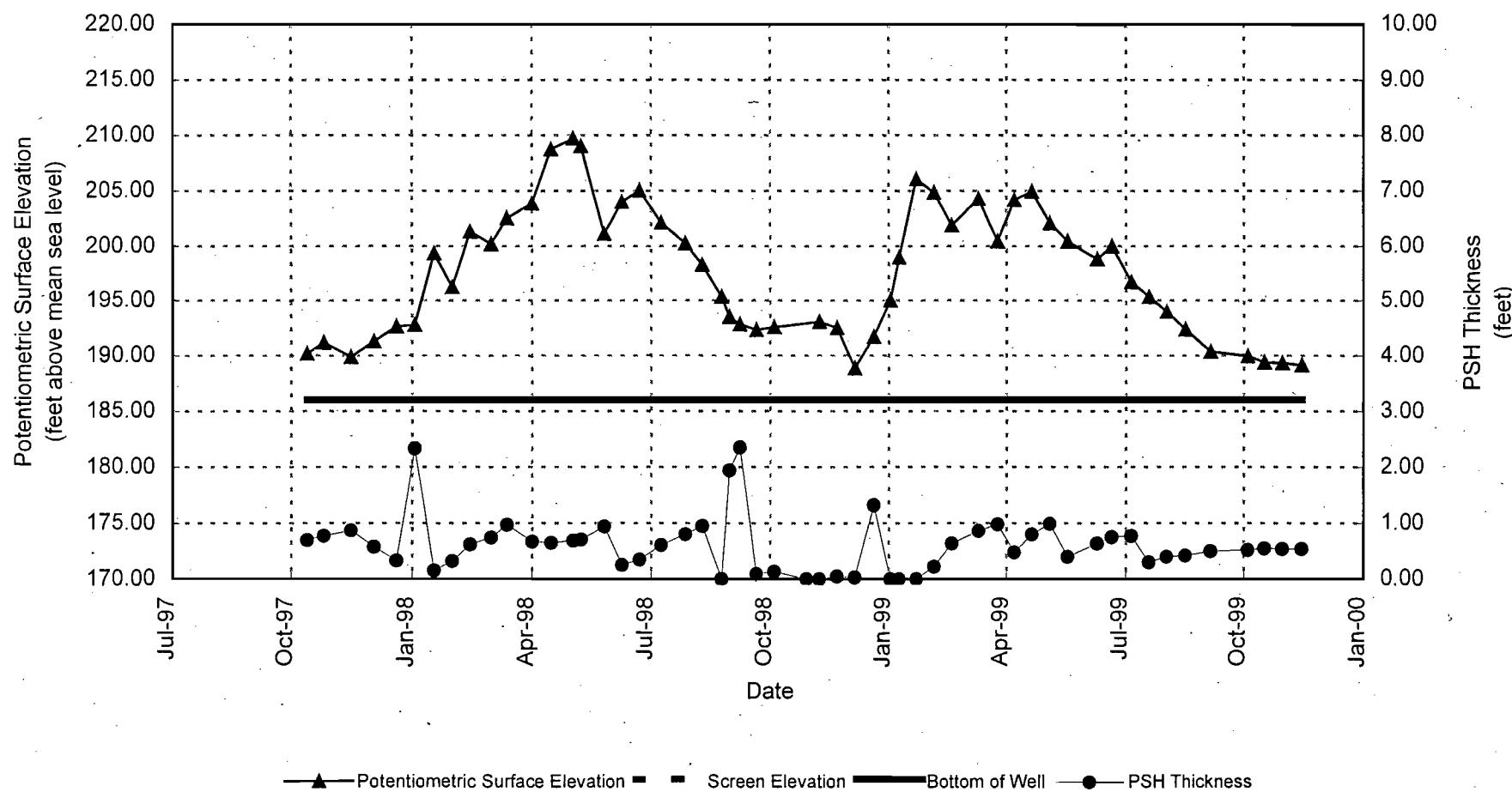
MONITORING DATA VS. TIME

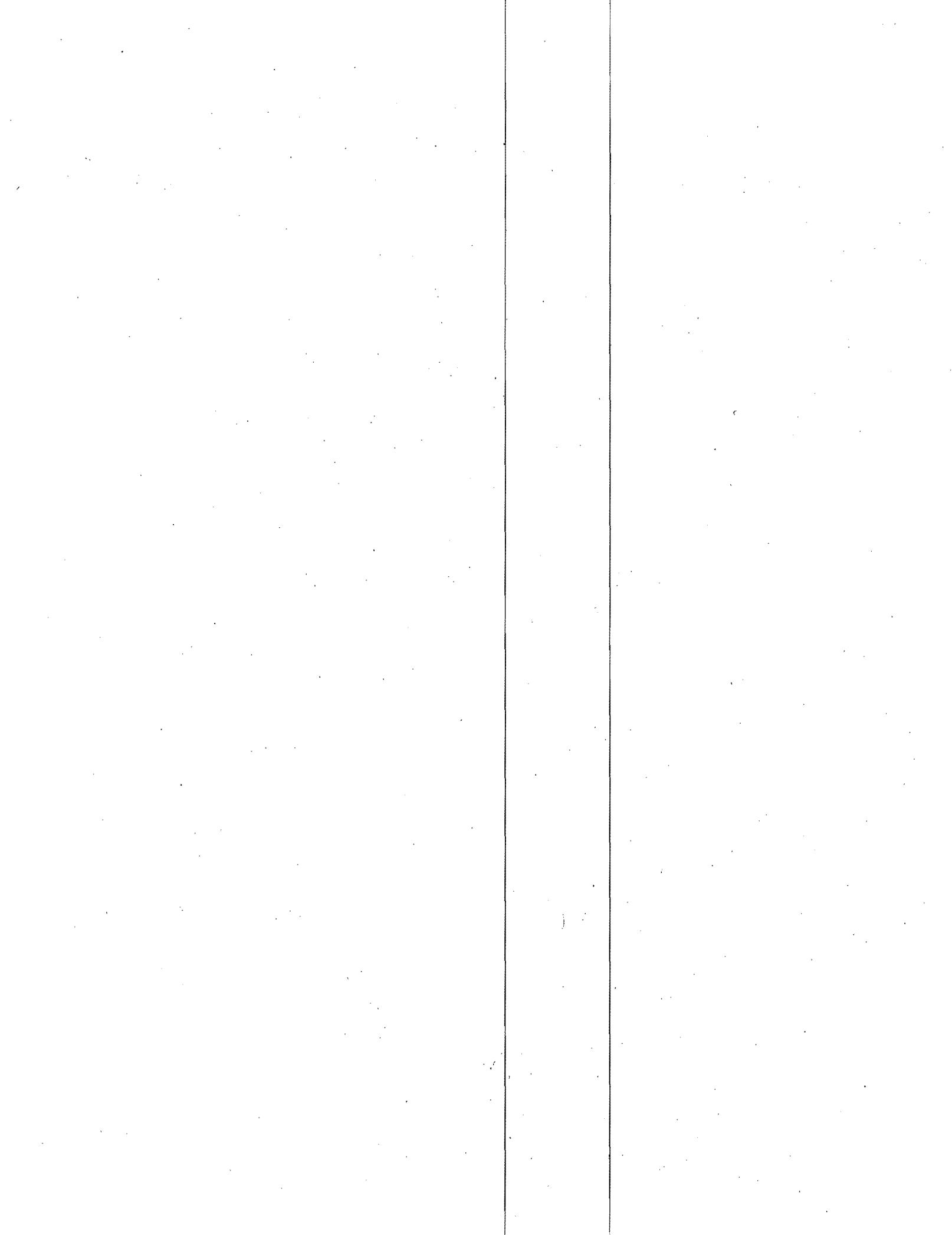
B-5

WILLIAMS REFINING, L.L.C.

543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE

TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:	Measurements in Feet			
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
B-7		Top of Casing Elevation Depth to Screen Well Depth	223.85 not available 44.50	PSH S.G. 0.7788	Assumed, based on S.G. of LNAPL measured in B-1 (10/99)
10/21/97		32.98	33.35	0.37	190.79
11/03/97		33.20	33.58	0.38	190.57
11/24/97		ND	33.06	ND	190.79
12/12/97		ND	32.83	ND	191.02
12/29/97		ND	32.14	ND	191.71
01/12/98		ND	31.29	ND	192.56
01/27/98		25.26	25.28	0.02	198.59
02/10/98		27.86	28.06	0.20	195.95
02/24/98		22.74	23.23	0.49	201.00
03/12/98		23.72	24.67	0.95	199.92
03/24/98		21.62	22.78	1.16	201.97
04/13/98		20.35	21.20	0.85	203.31
04/28/98		15.45	15.79	0.34	208.32
05/15/98		14.83	15.25	0.42	208.93
05/21/98		15.55	16.12	0.57	208.17
06/08/98		23.35	23.90	0.55	200.38
06/22/98		19.83	20.63	0.80	203.84
07/06/98		19.22	20.00	0.78	204.46
07/23/98		22.18	22.59	0.41	201.58
08/11/98		24.22	25.02	0.80	199.45
08/24/98		26.17	27.10	0.93	197.47
09/08/98		ND	29.38	ND	194.47
09/14/98		30.22	30.32	0.10	193.61
09/22/98		30.45	30.58	0.13	193.37
10/05/98		31.10	31.23	0.13	192.72
10/19/98		ND	31.08	ND	192.77
11/13/98		NG	NG	NG	
11/23/98		ND	28.44	ND	195.41
12/07/98		ND	29.90	ND	193.95
12/21/98		ND	28.97	ND	194.88
01/05/99		ND	29.32	ND	194.53
01/18/99		ND	26.60	ND	197.25
01/25/99		ND	22.90	ND	200.95
02/08/99		ND	15.90	ND	207.95
02/22/99		17.78	17.83	0.05	206.06
03/09/99		20.60	21.53	0.93	203.04
03/29/99		18.60	19.10	0.50	205.14
04/13/99		21.95	22.35	0.40	201.81
04/26/99		18.84	19.20	0.36	204.93
05/10/99		17.75	18.30	0.55	205.98
05/24/99		20.78	21.75	0.97	202.86
06/07/99		22.18	22.42	0.24	201.62
06/30/99		23.95	24.42	0.47	199.80
07/11/99		22.95	23.58	0.63	200.76
07/26/99		26.53	27.38	0.85	197.13
08/09/99		27.35	28.30	0.95	196.29
08/23/99		28.44	29.33	0.89	195.21
09/07/99		29.71	30.15	0.44	194.04
09/27/99		30.96	31.32	0.36	192.81
10/26/99		31.87	31.95	0.08	191.96
11/08/99		32.25	32.32	0.07	191.58
11/22/99		32.63	32.73	0.10	191.20
12/07/99		32.72	32.81	0.09	191.11

Notes:

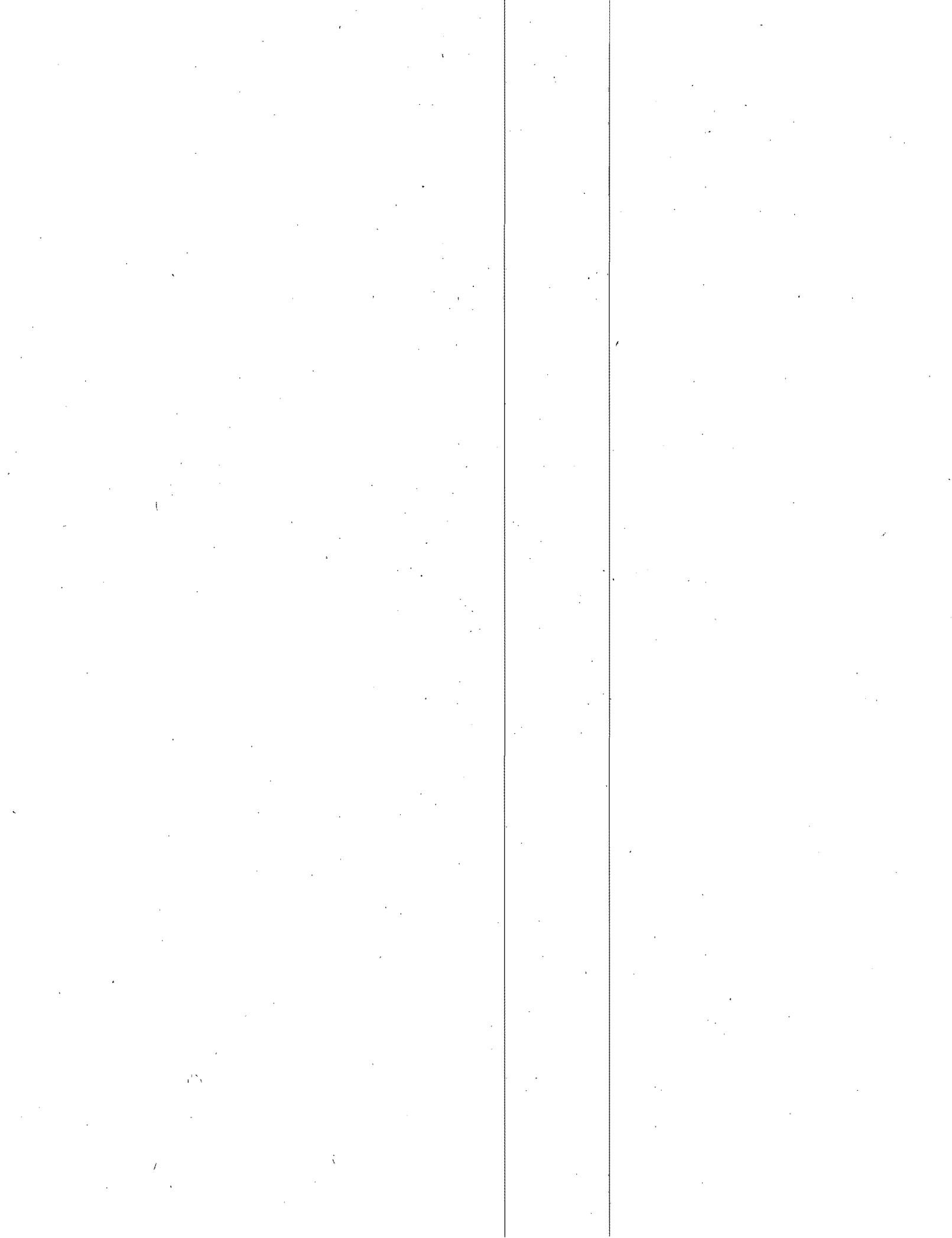
PSH = Phase separated hydrocarbons

ND = Not detected

NG = Not gauged

Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

$$\text{Potentiometric Surface Elevation} = \text{Top of Casing Elevation} - \text{Depth to Water} + (\text{Specific Gravity of PSH} \times \text{PSH Thickness})$$



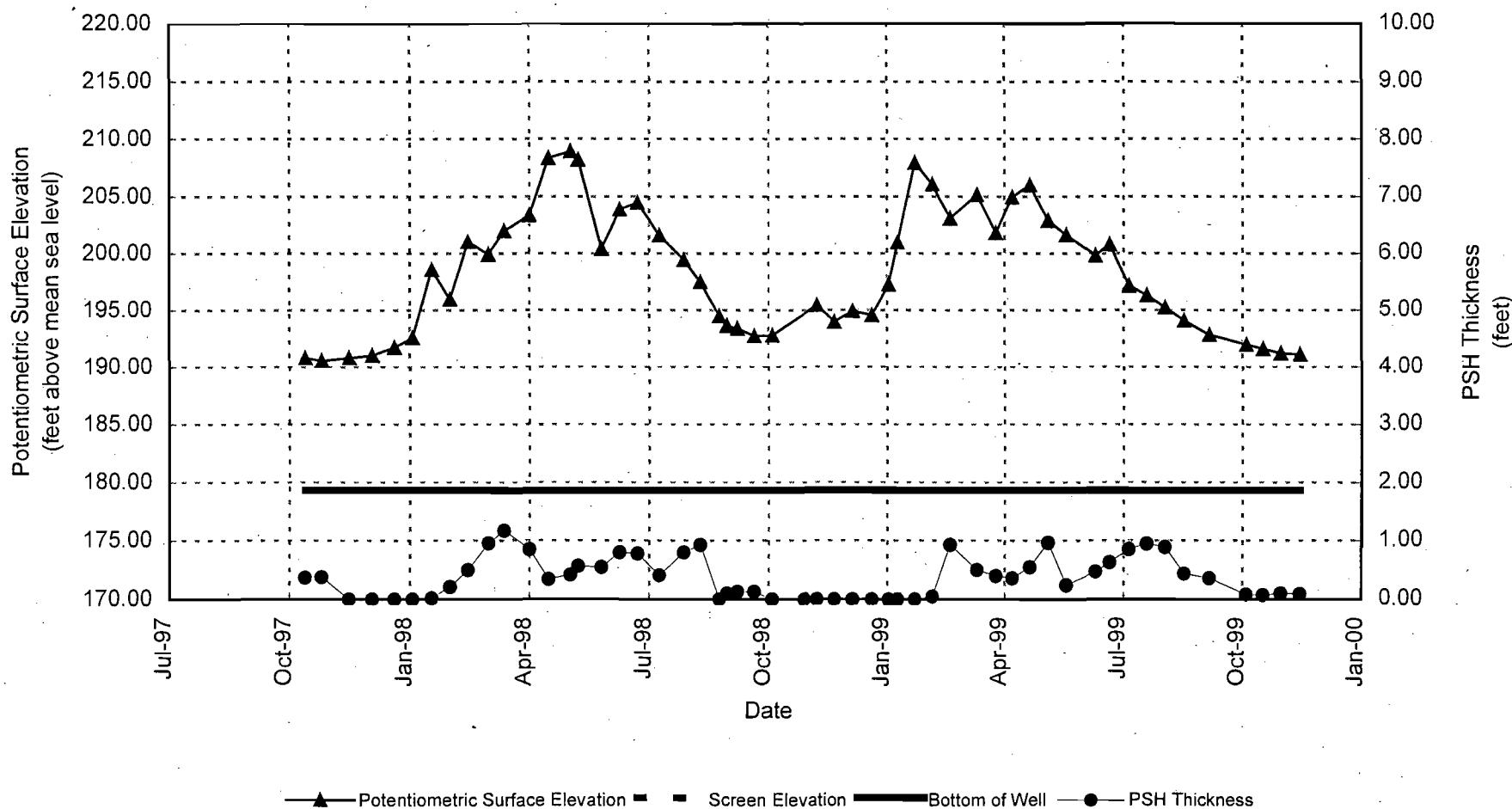
MONITORING DATA VS. TIME

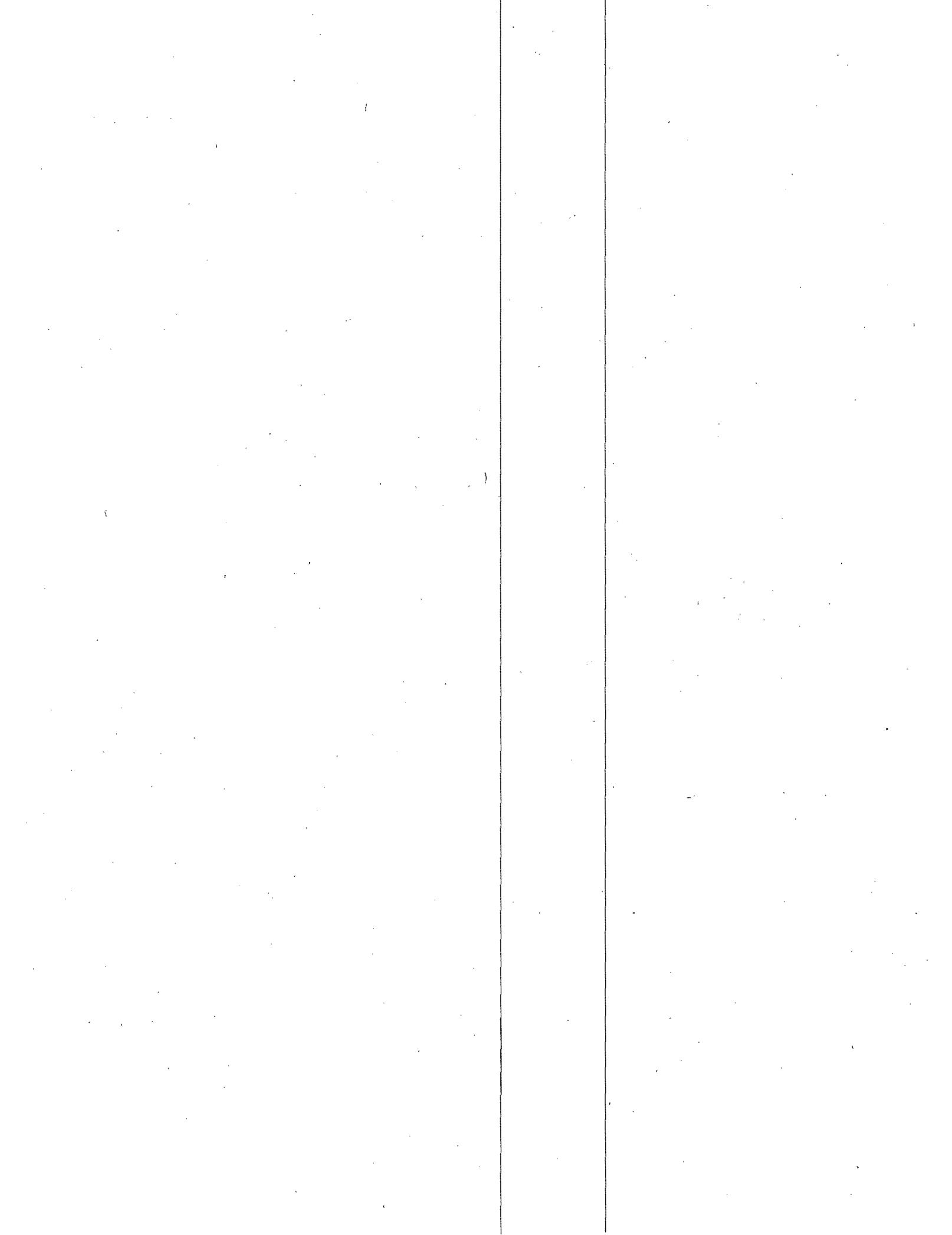
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WILLIAMS REFINING, L.L.C.

543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE

TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well: B-8	Construction:	Top of Casing Elevation	226.43	PSH S.G. 0.7788	Assumed, based on S.G. of LNAPL measured in B-1 (10/99)
		Depth to Screen	not available		
		Well Depth	38.00		
Measurements in Feet					
Monitoring Date	Notes	Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
10/20/97		34.95	35.68	0.73	191.32
11/03/97		35.29	35.94	0.65	191.00
11/25/97		35.47	36.02	0.55	190.84
12/12/97		34.78	36.94	2.16	191.17
12/29/97		33.62	34.65	1.03	192.58
01/12/98		33.51	34.02	0.51	192.81
01/27/98		27.88	29.28	1.40	198.24
02/10/98		30.74	30.89	0.15	195.66
02/24/98		26.10	30.66	4.56	199.32
03/12/98		25.75	33.38	7.63	198.99
03/25/98		23.30	32.10	8.80	201.18
04/13/98		21.25	32.95	11.70	202.59
04/28/98		15.49	32.18	16.69	207.25
05/15/98		ND	19.43	ND	207.00
05/22/98		17.84	22.30	4.46	207.60
06/08/98		23.34	32.21	8.87	201.13
06/22/98		21.15	23.04	1.89	204.86
07/06/98		19.68	32.88	13.20	203.83
07/23/98		22.24	32.20	9.96	201.99
08/11/98		25.03	33.54	8.51	199.52
08/24/98		28.45	30.30	1.85	197.57
09/08/98		ND	31.25	ND	195.18
09/14/98		32.72	32.75	0.03	193.70
09/22/98		33.54	33.59	0.05	192.88
10/05/98		34.13	34.25	0.12	192.27
10/19/98		34.02	34.37	0.35	192.33
11/13/98		34.40	34.70	0.30	191.96
11/23/98		33.63	33.92	0.29	192.74
12/07/98		34.35	34.92	0.57	191.95
12/21/98		33.98	34.27	0.29	192.39
01/05/99		33.94	35.23	1.29	192.20
01/18/99		32.13	33.06	0.93	194.09
01/25/99		29.45	29.48	0.03	196.97
02/08/99		21.38	26.75	5.37	203.86
02/22/99		19.92	32.67	12.75	203.69
03/08/99		23.03	33.03	10.00	201.19
03/29/99		20.34	33.22	12.88	203.24
04/13/99		24.63	33.59	8.96	199.82
04/26/99		21.55	32.51	10.96	202.46
05/10/99		21.67	29.12	7.45	203.11
05/24/99		21.50	34.35	12.85	202.09
06/07/99		24.73	33.43	8.70	199.78
06/30/99		26.72	33.55	6.83	198.20
07/11/99		25.76	33.06	7.30	199.06
07/26/99		29.88	31.10	1.22	196.28
08/09/99		31.33	31.63	0.30	195.03
08/23/99		32.46	32.68	0.22	193.92
09/07/99		33.93	35.22	1.29	192.21
09/27/99		Dry	Dry	Dry	
10/26/99		ND	36.67	ND	189.76
11/08/99		36.95	37.10	0.15	189.45
11/22/99		ND	37.02	ND	189.41
12/07/99		ND	37.00	ND	189.43

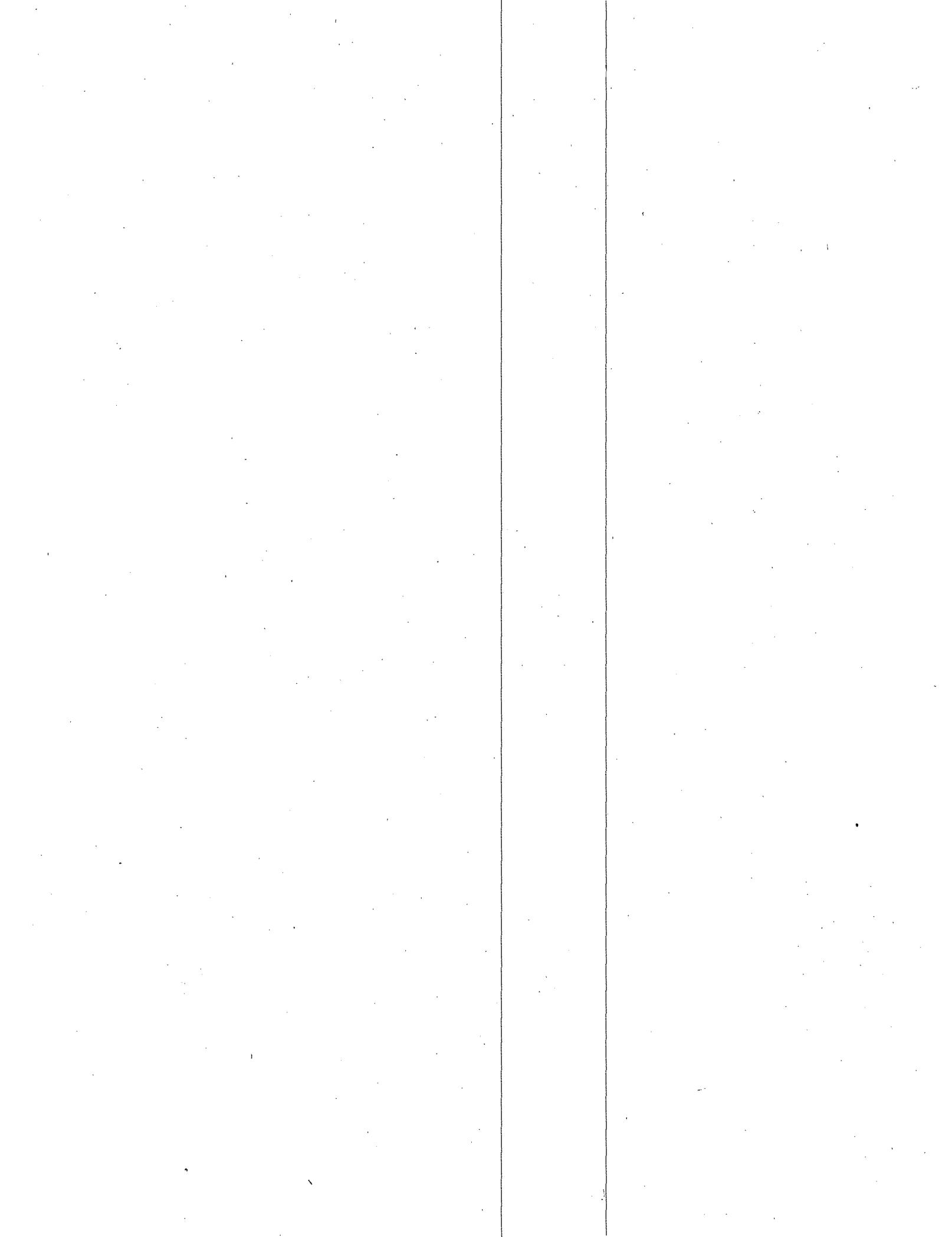
Notes:

PSH = Phase separated hydrocarbons

ND = Not detected NG = Not gauged

Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

Potentiometric Surface Elevation = Top of Casing Elevation - Depth to Water + (Specific Gravity of PSH x PSH Thickness)



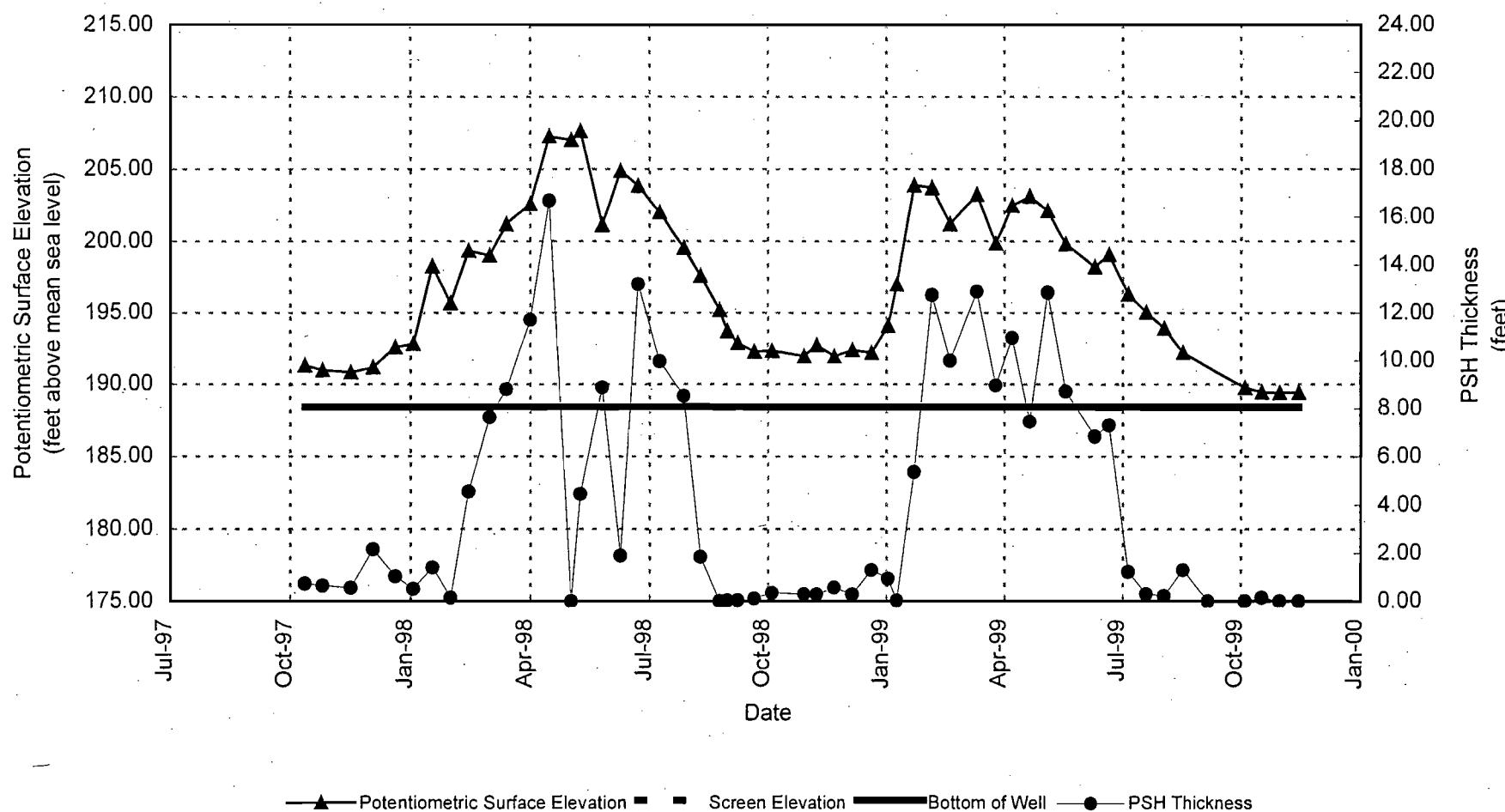
MONITORING DATA VS. TIME

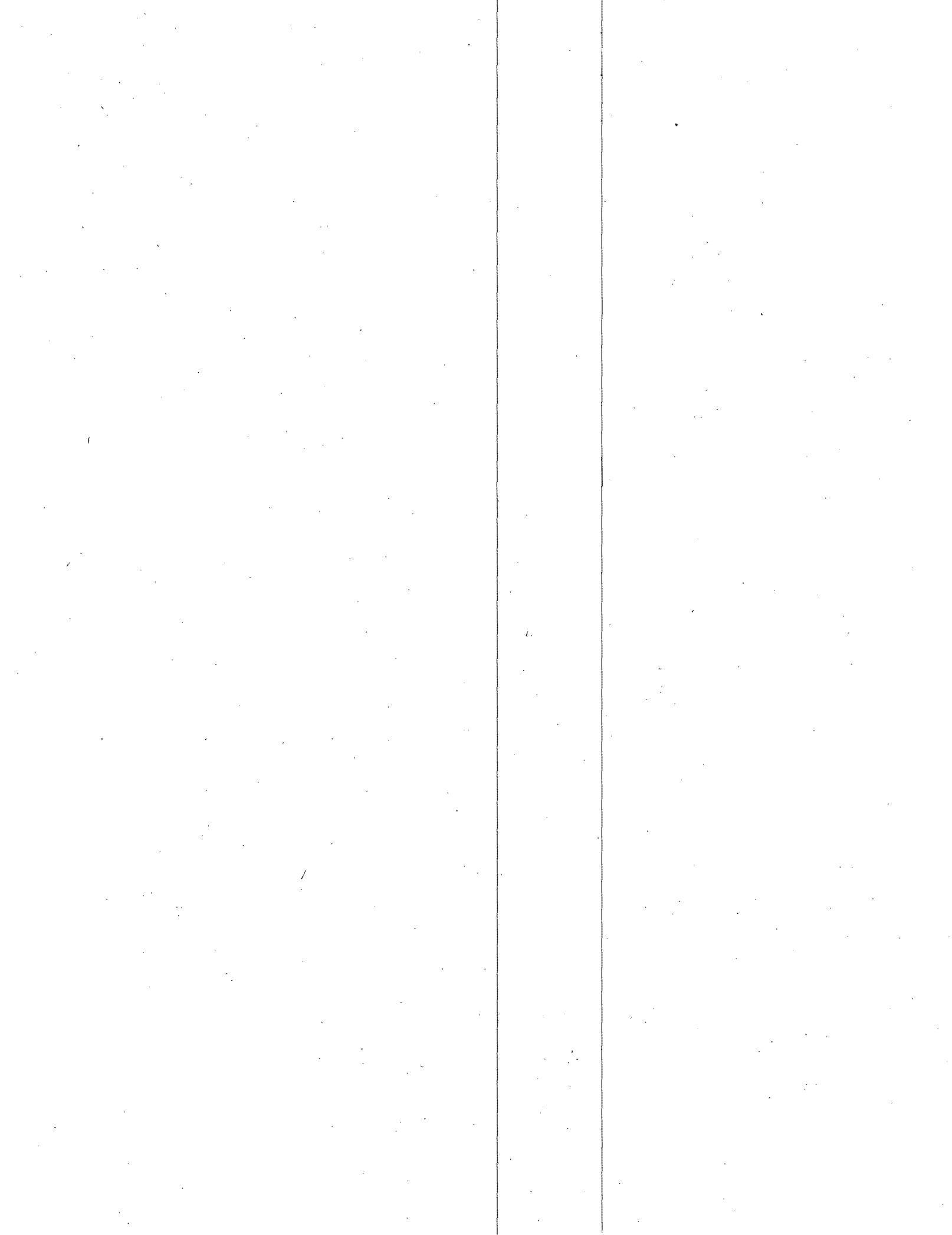
B-8

WILLIAMS REFINING, L.L.C.

543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE

TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:				
		Top of Casing Elevation	224.97	PSH S.G.	0.8008
		Depth to Screen	not available		
B-9		Well Depth	38.85		Assumed, based on S.G. of LNAPL measured in RW-3(R) (10/99)
Measurements in Feet					
Monitoring Date	Notes	Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
10/20/97		36.63	37.08	0.45	188.25
11/03/97		36.79	37.40	0.61	188.06
11/25/97		37.06	37.77	0.71	187.77
12/12/97		36.56	37.01	0.45	188.32
12/29/97		35.89	36.11	0.22	189.04
01/12/98		32.88	33.66	0.78	191.93
01/27/98		31.11	31.89	0.78	193.70
02/10/98		33.23	34.04	0.81	191.58
02/24/98		30.60	31.38	0.78	194.21
03/12/98		28.53	29.29	0.76	196.29
03/25/98		28.54	29.30	0.76	196.28
04/13/98		27.09	27.86	0.77	197.73
04/28/98		22.96	23.72	0.76	201.86
05/15/98		20.93	21.70	0.77	203.89
05/22/98		21.97	22.74	0.77	202.85
06/08/98		27.66	28.39	0.73	197.16
06/22/98		27.98	28.12	0.14	196.96
07/06/98		25.60	26.25	0.65	199.24
07/23/98		27.23	27.95	0.72	197.60
08/11/98		28.20	28.90	0.70	196.63
08/24/98		NG	NG	NG	
09/08/98		32.00	32.83	0.83	192.80
09/14/98		33.36	34.12	0.76	191.46
09/22/98		34.50	35.22	0.72	190.33
10/05/98		34.81	35.50	0.69	190.02
10/19/98		ND	35.58	ND	189.39
11/13/98		36.26	36.63	0.37	188.64
11/23/98		36.10	36.45	0.35	188.80
12/07/98		35.98	36.48	0.50	188.89
12/21/98		35.57	36.07	0.50	189.30
01/05/99		34.12	34.97	0.85	190.68
01/18/99		34.04	34.14	0.10	190.91
01/25/99		32.20	33.18	0.98	192.57
02/08/99		26.35	27.30	0.95	198.43
02/22/99		26.24	27.16	0.92	198.55
03/08/99		27.39	28.08	0.69	197.44
03/29/99		26.04	26.93	0.89	198.75
04/13/99		28.51	29.34	0.83	196.29
04/26/99		27.49	28.32	0.83	197.31
05/10/99		26.27	27.13	0.86	198.53
05/24/99		26.85	27.70	0.85	197.95
06/07/99		28.44	29.26	0.82	196.37
06/30/99		29.88	30.63	0.75	194.94
07/11/99		29.65	30.45	0.80	195.16
07/26/99		30.93	31.77	0.84	193.87
08/09/99		32.20	32.98	0.78	192.61
08/23/99		33.30	34.17	0.87	191.50
09/07/99		31.80	35.63	3.83	192.41
09/27/99		36.63	36.85	0.22	188.30
10/26/99			38.85		186.12
10/26/99		DRY	DRY		
11/08/99		DRY	DRY		
11/22/99		DRY	DRY		
12/07/99		DRY	DRY		

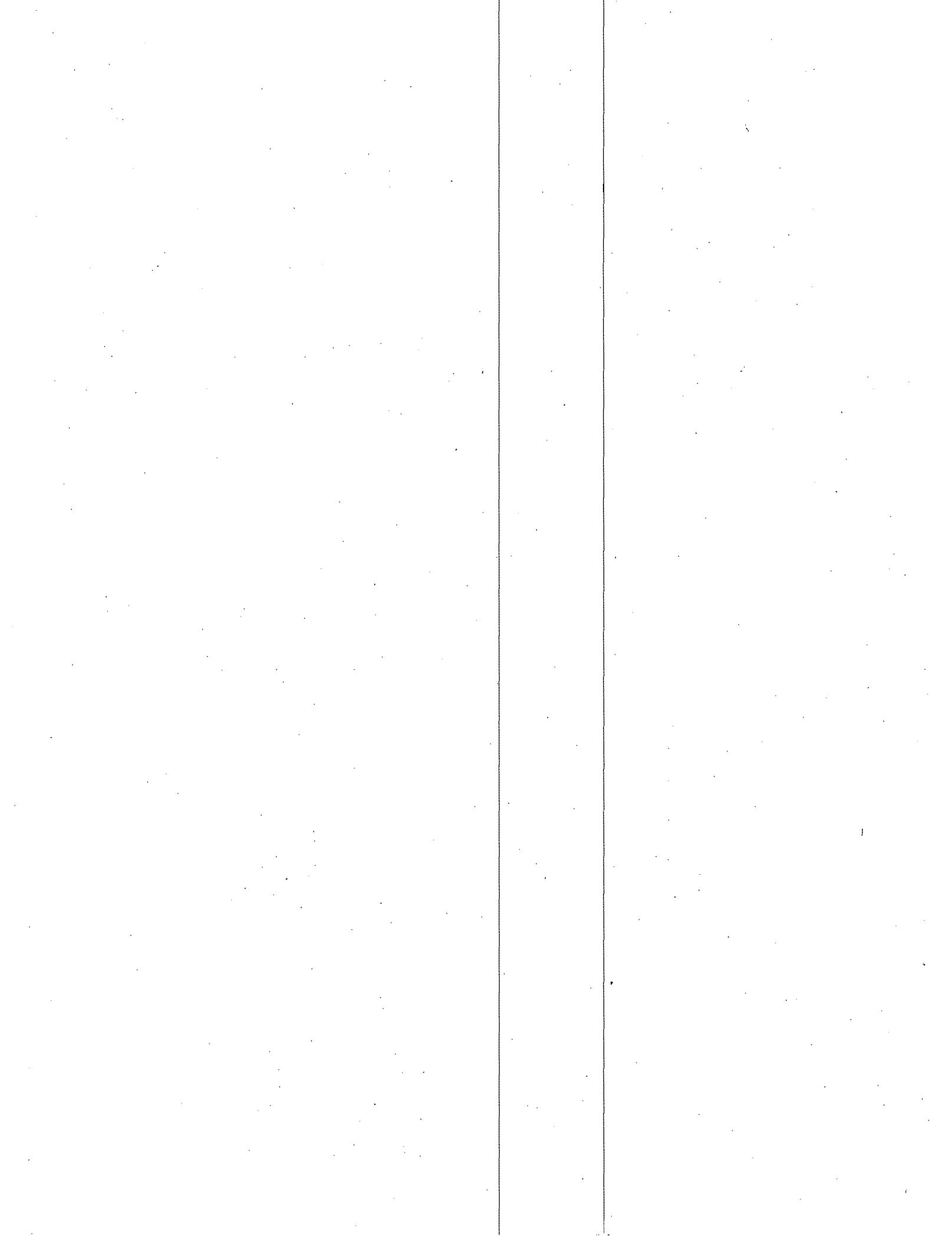
Notes:

PSH = Phase separated hydrocarbons

ND = Not detected NG = Not gauged

Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

$$\text{Potentiometric Surface Elevation} = \text{Top of Casing Elevation} - \text{Depth to Water} + (\text{Specific Gravity of PSH} \times \text{PSH Thickness})$$



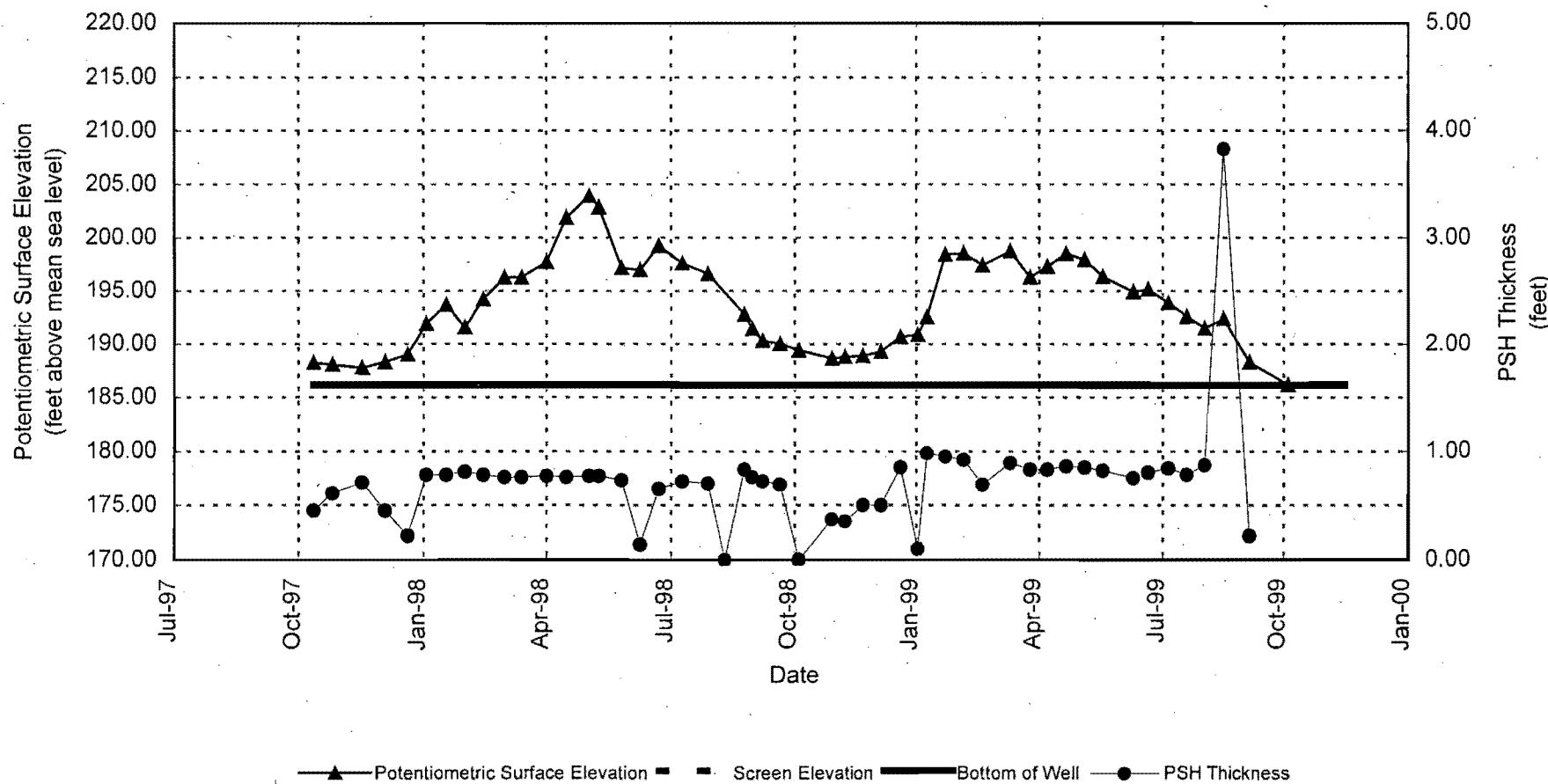
MONITORING DATA VS. TIME

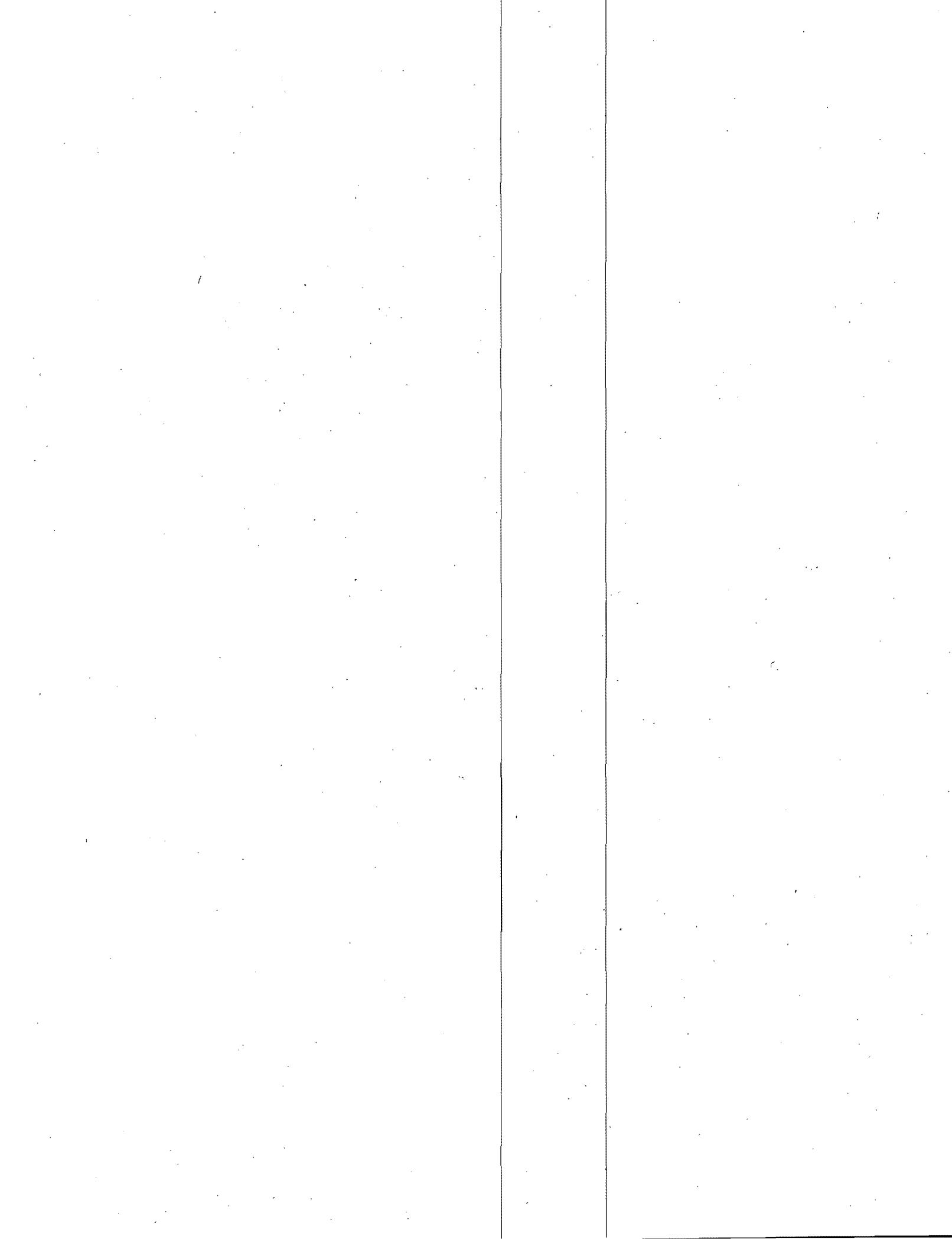
B-9

WILLIAMS REFINING, L.L.C.

543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE

TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well: G-1	Construction:	Top of Casing Elevation	217.76	PSH S.G. 0.8265	Assumed, based on S.G. of LNAPL measured in RW-8 (10/99)
		Depth to Screen	not available		
		Well Depth	59.26		
Measurements in Feet					
Monitoring Date	Notes	Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
10/20/97		22.97	23.72	0.75	194.66
11/03/97		22.43	24.17	1.74	195.03
11/25/97		23.36	23.97	0.61	194.29
12/12/97		23.51	24.12	0.61	194.14
12/29/97		22.95	23.64	0.69	194.69
01/12/98		20.97	21.60	0.63	196.68
01/27/98		16.03	16.69	0.66	201.62
02/10/98		20.94	21.58	0.64	196.71
02/24/98		13.95	14.59	0.64	203.70
03/12/98		14.90	15.56	0.66	202.75
03/25/98		13.01	13.69	0.68	204.63
04/13/98		12.35	13.06	0.71	205.29
04/28/98		18.45	18.85	0.40	199.24
05/15/98		7.30	7.35	0.05	210.45
05/22/98		8.09	8.60	0.51	209.58
06/08/98		14.80	15.38	0.58	202.86
06/22/98		11.28	11.88	0.60	206.38
07/06/98		11.15	11.78	0.63	206.50
07/23/98		13.67	14.05	0.38	204.02
08/11/98		15.43	16.10	0.67	202.21
08/24/98	NG	NG	NG		
09/08/98		20.73	21.48	0.75	196.90
09/14/98		21.50	22.03	0.53	196.17
09/22/98		21.90	22.67	0.77	195.73
10/05/98		22.53	23.28	0.75	195.10
10/19/98		21.92	22.65	0.73	195.71
11/13/98		22.43	23.16	0.73	195.20
11/23/98		21.38	22.10	0.72	196.26
12/07/98		22.91	23.66	0.75	194.72
12/21/98		21.22	21.97	0.75	196.41
01/05/99		22.00	22.75	0.75	195.63
01/18/99		19.27	19.97	0.70	198.37
01/25/99		15.39	15.79	0.40	202.30
02/08/99		9.22	9.83	0.61	208.43
02/22/99		11.51	12.10	0.59	206.15
03/08/99		14.66	15.32	0.66	202.99
03/29/99		13.07	13.81	0.74	204.56
04/13/99		15.48	16.32	0.84	202.13
04/26/99		13.29	14.16	0.87	204.32
05/10/99		11.13	12.07	0.94	206.47
05/24/99		14.13	15.05	0.92	203.47
06/07/99		15.31	16.33	1.02	202.27
06/30/99	ND		18.07	ND	199.69
07/11/99		17.09	17.12	0.03	200.66
07/26/99		21.48	21.55	0.07	196.27
08/09/99		21.72	21.78	0.06	196.03
08/23/99		22.90	22.97	0.07	194.85
09/07/99		23.37	23.42	0.05	194.38
09/27/99		25.00	26.06	1.06	192.58
10/26/99		25.39	25.41	0.02	192.37
11/08/99	ND		25.78	ND	191.98
11/22/99		26.15	26.17	0.02	191.61
12/07/99		25.73	25.75	0.02	192.03

Notes:

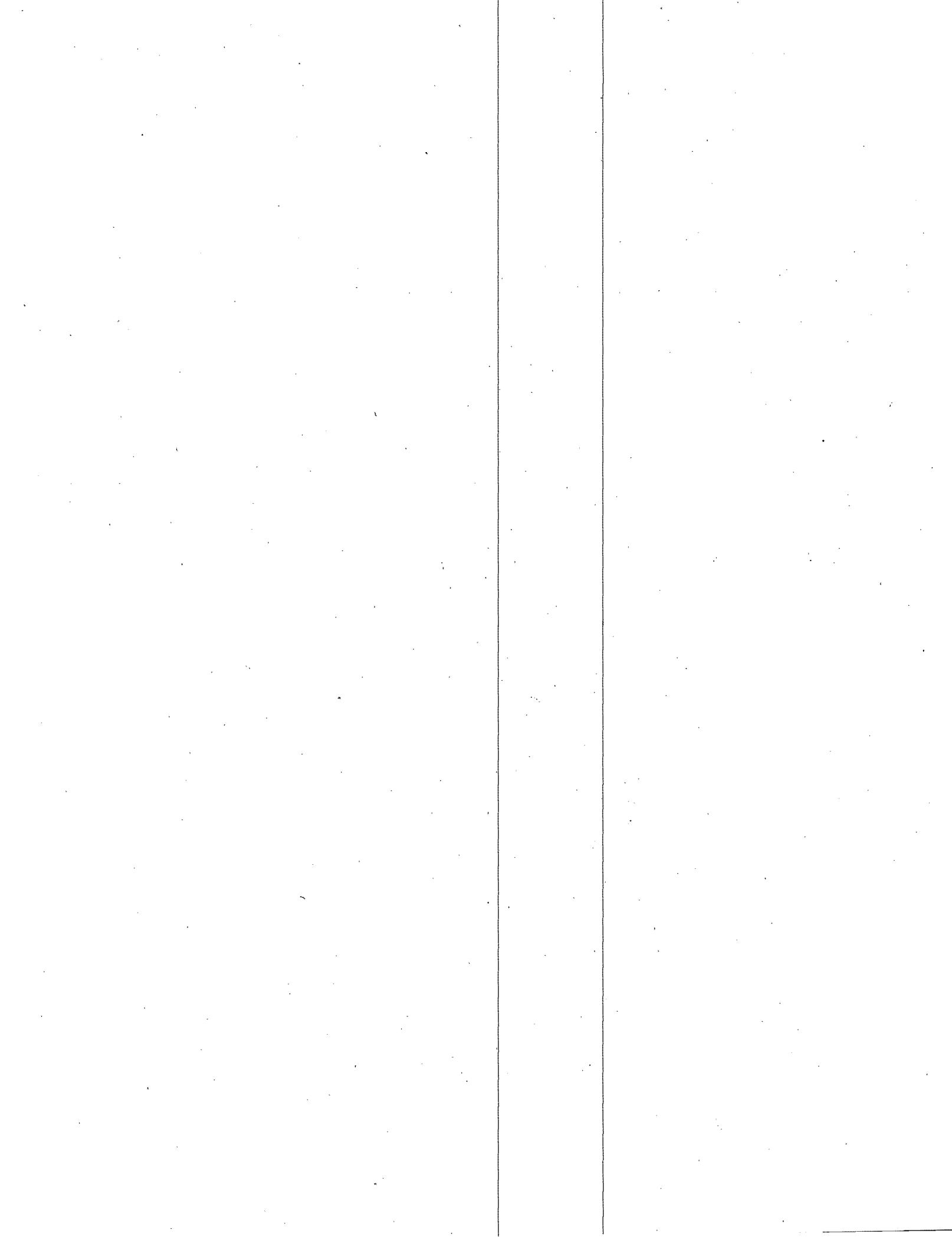
PSH = Phase separated hydrocarbons

ND = Not detected

NG = Not gauged

Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

$$\text{Potentiometric Surface Elevation} = \text{Top of Casing Elevation} - \text{Depth to Water} + (\text{Specific Gravity of PSH} \times \text{PSH Thickness})$$



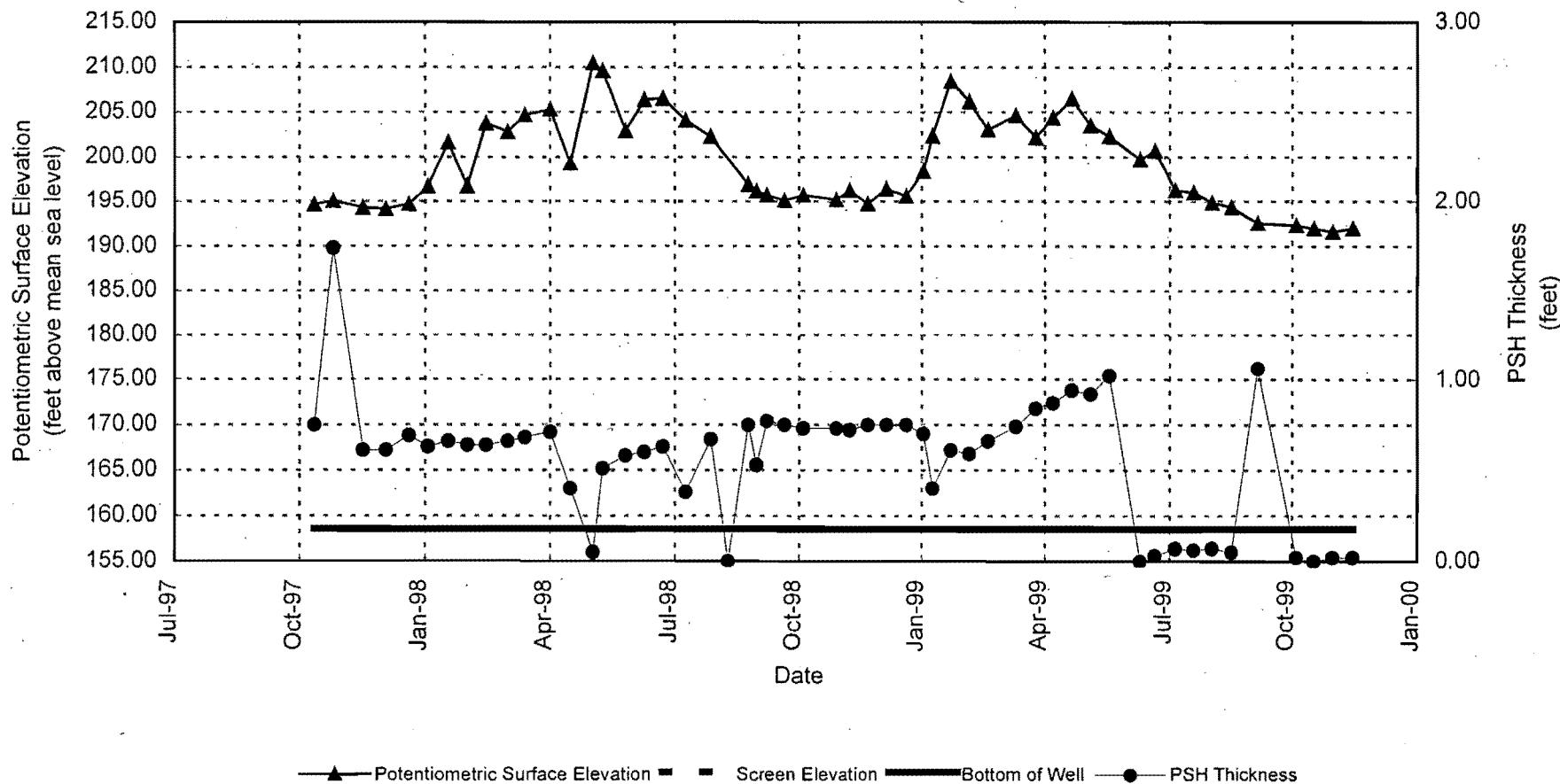
MONITORING DATA VS. TIME

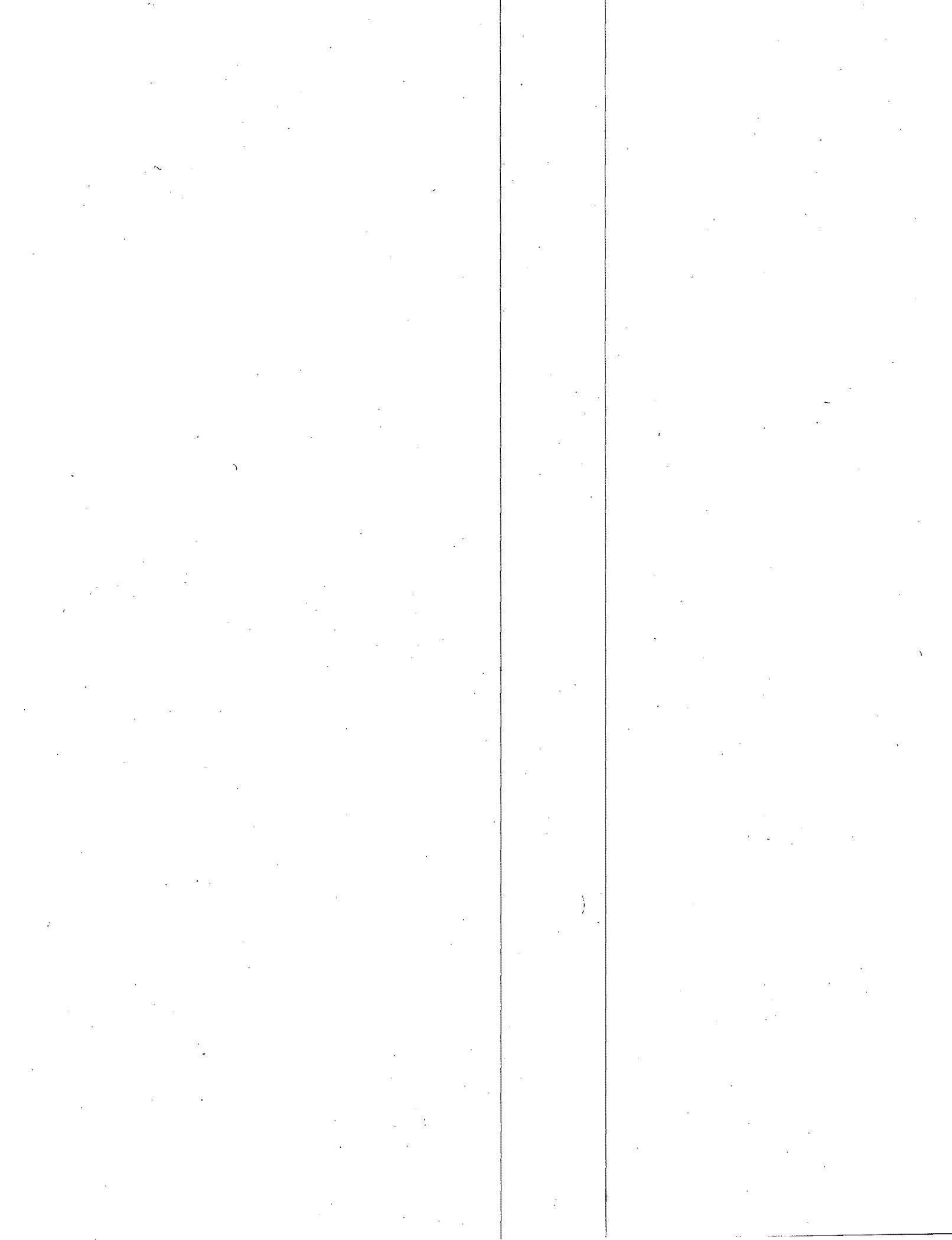
G-1

WILLIAMS REFINING, L.L.C.

543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE

TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:	Top of Casing Elevation Depth to Screen Well Depth	216.24 not available 62.40	PSH S.G. 0.7905	Assumed, based on S.G. of LNAPL measured in G-3 (10/99)
Monitoring Date	Notes	Measurements in Feet			
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
10/20/97		15.99	16.62	0.63	200.12
11/03/97		15.98	16.64	0.66	200.12
11/25/97		16.08	16.70	0.62	200.03
12/12/97		16.69	16.82	0.13	199.52
12/29/97		15.41	16.61	1.20	200.58
01/12/98		13.17	15.36	2.19	202.61
01/27/98		10.09	10.51	0.42	206.06
02/10/98		12.35	13.12	0.77	203.73
02/24/98		8.76	9.46	0.70	207.33
03/12/98		8.78	9.76	0.98	207.25
03/25/98		7.60	8.67	1.07	208.42
04/13/98		7.03	8.48	1.45	208.91
04/28/98		4.93	5.21	0.28	211.25
05/15/98		3.64	3.74	0.10	212.58
05/22/98		4.22	4.64	0.42	211.93
06/08/98		7.55	16.36	8.81	206.84
06/22/98		7.25	8.68	1.43	208.69
07/06/98		7.30	8.24	0.94	208.74
07/23/98		9.09	10.57	1.48	206.84
08/11/98		8.40	14.03	5.63	206.66
08/24/98		11.93	13.18	1.25	204.05
09/08/98		14.12	16.52	2.40	201.62
09/14/98		14.91	16.82	1.91	200.93
09/22/98		15.59	17.23	1.64	200.31
10/05/98		15.83	18.73	2.90	199.80
10/19/98		15.30	17.40	2.10	200.50
11/13/98		NG	NG	NG	
11/23/98		15.13	16.90	1.77	200.74
12/07/98		16.19	18.42	2.23	199.58
12/21/98		14.67	17.08	2.41	201.07
01/05/99		15.10	17.28	2.18	200.68
01/18/99		13.67	15.50	1.83	202.19
01/25/99		11.05	11.32	0.27	205.13
02/08/99		6.45	6.79	0.34	209.72
02/22/99		7.99	8.25	0.26	208.20
03/08/99		8.55	16.70	8.15	205.98
03/29/99		8.04	8.50	0.46	208.10
04/13/99		8.42	16.81	8.39	206.06
04/26/99		7.95	8.88	0.93	208.10
05/10/99		6.63	7.33	0.70	209.46
05/24/99		8.25	13.20	4.95	206.95
06/07/99		10.30	13.05	2.75	205.36
06/30/99		12.14	13.75	1.61	203.76
07/11/99		11.56	14.73	3.17	204.02
07/26/99		14.45	16.85	2.40	201.29
08/09/99		15.50	17.10	1.60	200.40
08/23/99		16.28	18.80	2.52	199.43
09/07/99		16.89	20.54	3.65	198.59
09/27/99		17.34	22.11	4.77	197.90
10/26/99		17.74	23.14	5.40	197.37
11/08/99		18.28	22.98	4.70	196.98
11/22/99		17.97	22.65	4.68	197.29
12/07/99		17.97	22.75	4.78	197.27

Notes:

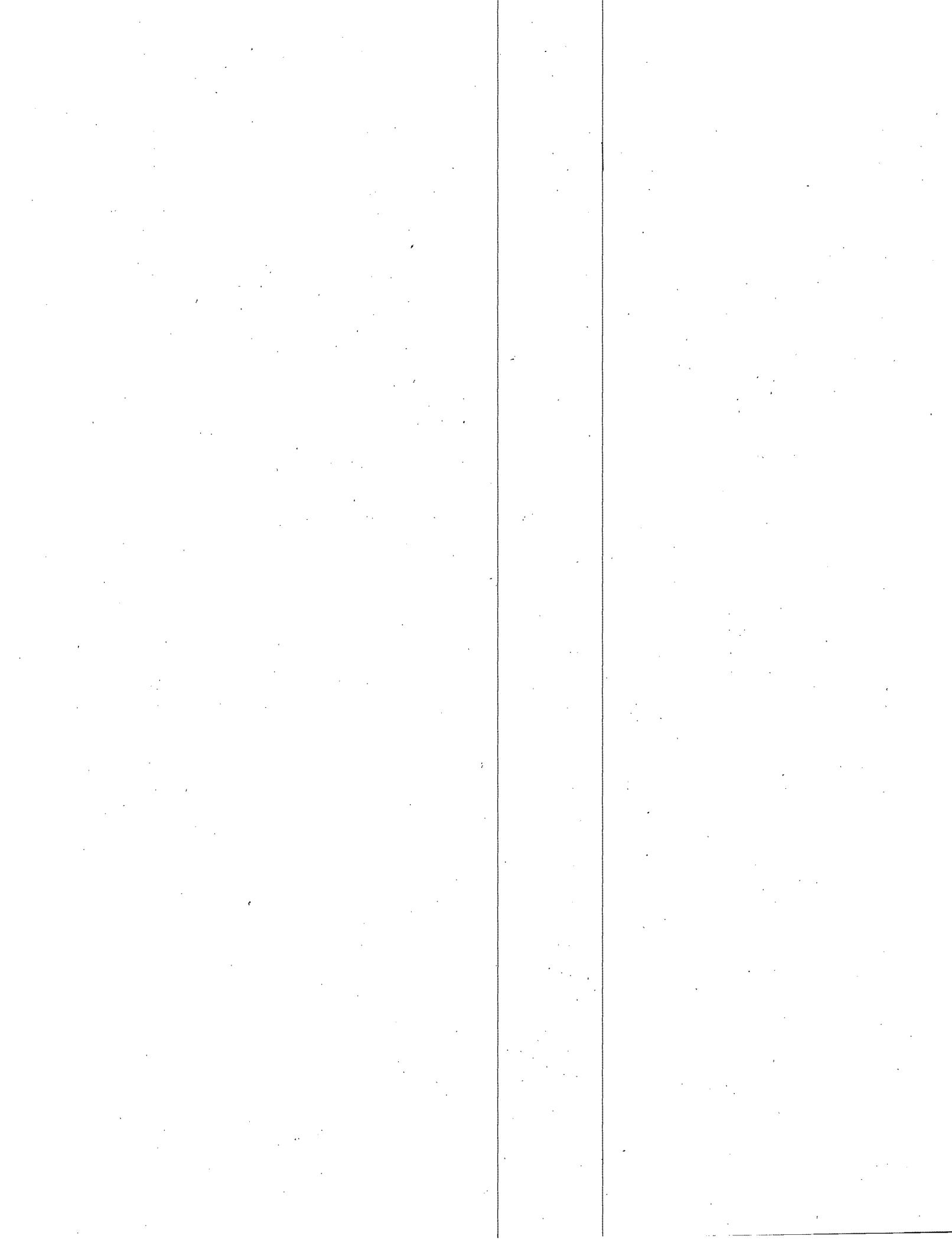
PSH = Phase separated hydrocarbons

ND = Not detected

NG = Not gauged

Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

Potentiometric Surface Elevation = Top of Casing Elevation - Depth to Water + (Specific Gravity of PSH x PSH Thickness)



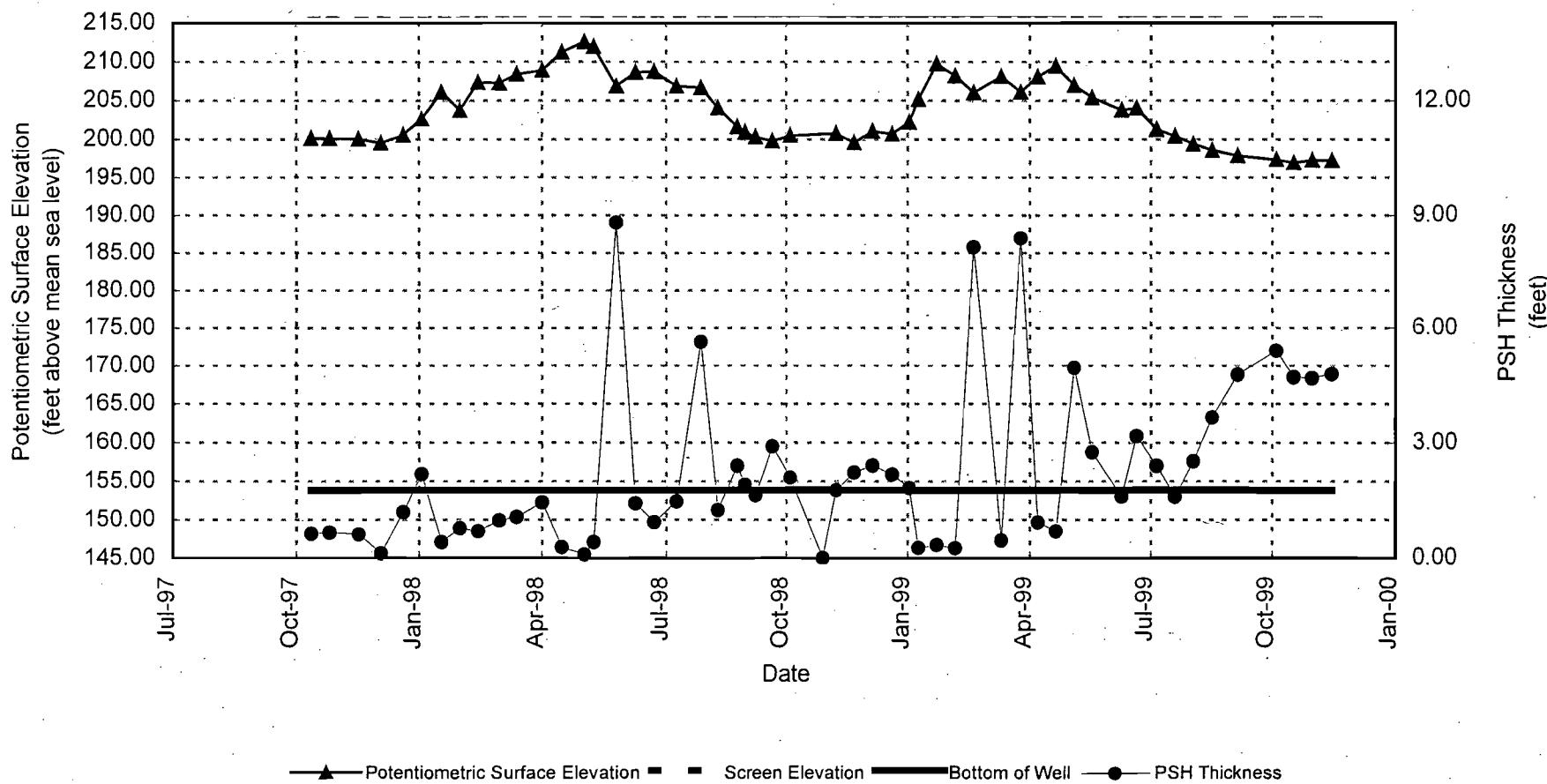
MONITORING DATA VS. TIME

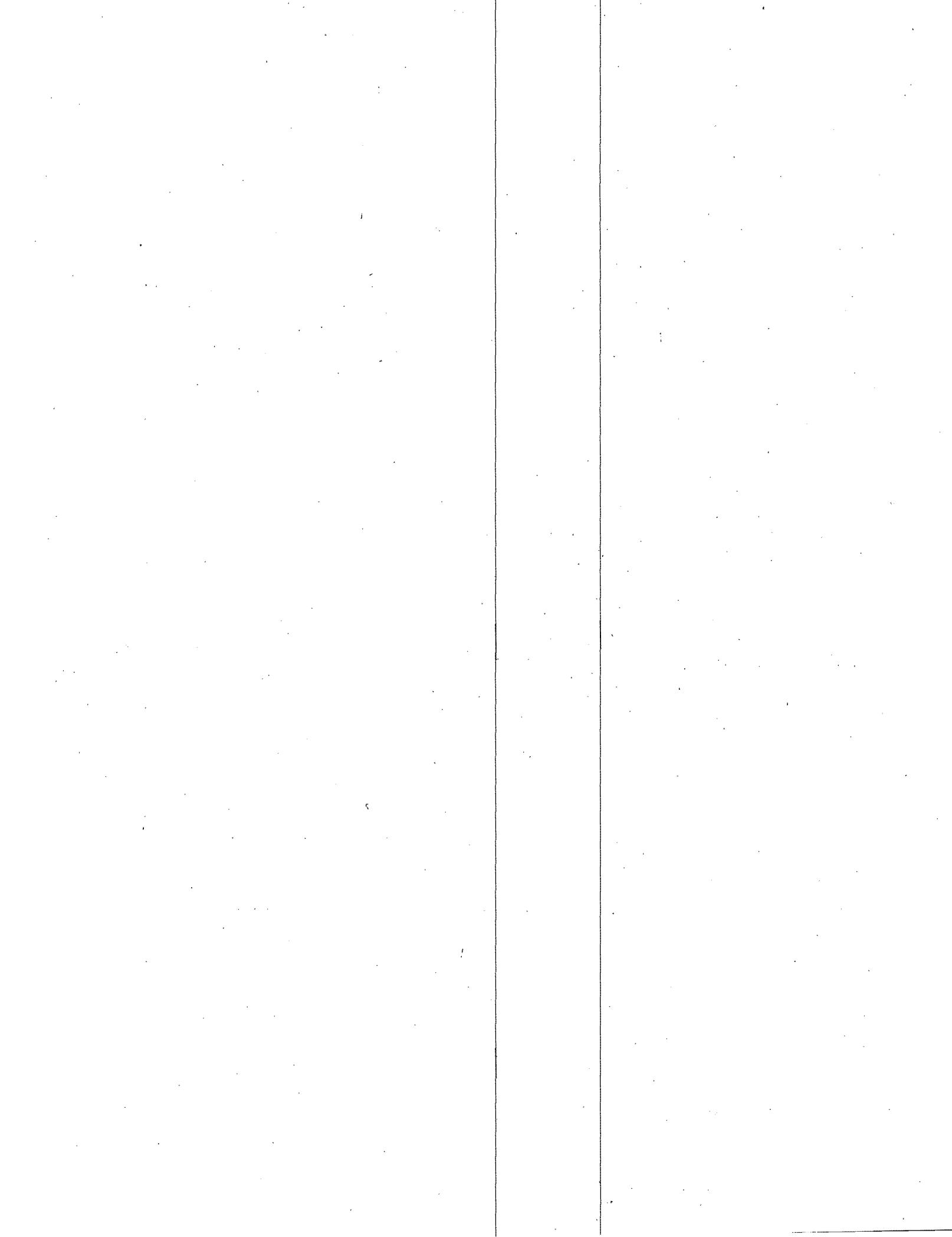
G-3

WILLIAMS REFINING, L.L.C.

543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE

TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:				
		Top of Casing Elevation	232.70	PSH S.G.	0.8328 Measured (10/99)
Monitoring Date	Notes	Measurements in Feet			
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
10/20/97		35.19	38.57	3.38	196.94
11/03/97		33.10	35.82	2.72	199.15
11/25/97		33.24	36.01	2.77	199.00
12/12/97		27.28	28.90	1.62	205.15
12/29/97		28.17	29.53	1.36	204.30
01/12/98		22.95	25.38	2.43	209.34
01/27/98		19.50	21.10	1.60	212.93
02/10/98		26.02	29.27	3.25	206.14
02/24/98		26.02	27.64	1.62	206.41
03/12/98		25.62	31.23	5.61	206.14
03/25/98		24.18	27.20	3.02	208.02
04/13/98		20.83	24.30	3.47	211.29
04/28/98		12.70	17.00	4.30	219.28
05/15/98		16.91	17.35	0.44	215.72
05/22/98		16.97	18.10	1.13	215.54
06/08/98		17.32	18.38	1.06	215.20
06/22/98		20.35	24.92	4.57	211.59
07/06/98		20.28	23.13	2.85	211.94
07/23/98		18.95	21.08	2.12	213.39
08/11/98		21.68	29.25	7.57	209.75
08/24/98		26.60	29.45	2.85	205.62
09/08/98		29.32	32.02	2.70	202.93
09/14/98		30.64	31.10	0.46	201.98
09/22/98		32.88	33.03	0.15	199.79
10/05/98		33.54	34.40	0.86	199.02
10/19/98		34.08	40.32	6.24	197.58
11/13/98		34.40	36.28	1.88	197.99
11/23/98		34.83	36.39	1.56	197.61
12/07/98		22.55	23.10	0.55	210.06
12/21/98		35.15	37.70	2.55	197.12
01/05/99		30.40	30.82	0.42	202.23
01/18/99		28.88	30.20	1.32	203.60
01/25/99		26.15	26.65	0.50	206.47
02/08/99		23.10	23.60	0.50	209.52
02/22/99		23.45	24.34	0.89	209.10
03/08/99		22.25	23.45	1.20	210.25
03/29/99		20.73	22.20	1.47	211.72
04/13/99		22.32	25.25	2.93	209.89
04/26/99		11.63	12.38	0.75	220.94
05/10/99		19.54	20.15	0.61	213.06
05/24/99		19.79	21.65	1.86	212.60
06/07/99		20.59	22.40	1.81	211.81
06/30/99		20.67	22.67	2.00	211.70
07/11/99		21.88	28.75	6.87	209.67
07/26/99		24.45	26.85	2.40	207.85
08/09/99		25.38	26.40	1.02	207.15
08/23/99		26.84	27.84	1.00	205.69
09/07/99		27.65	29.90	2.25	204.67
09/27/99		31.10	33.11	2.01	201.26
10/26/99		32.93	34.22	1.29	199.55
11/08/99		31.65	31.68	0.03	201.04
11/22/99		30.57	31.48	0.91	201.98
12/07/99		28.88	30.02	1.14	203.63

Notes:

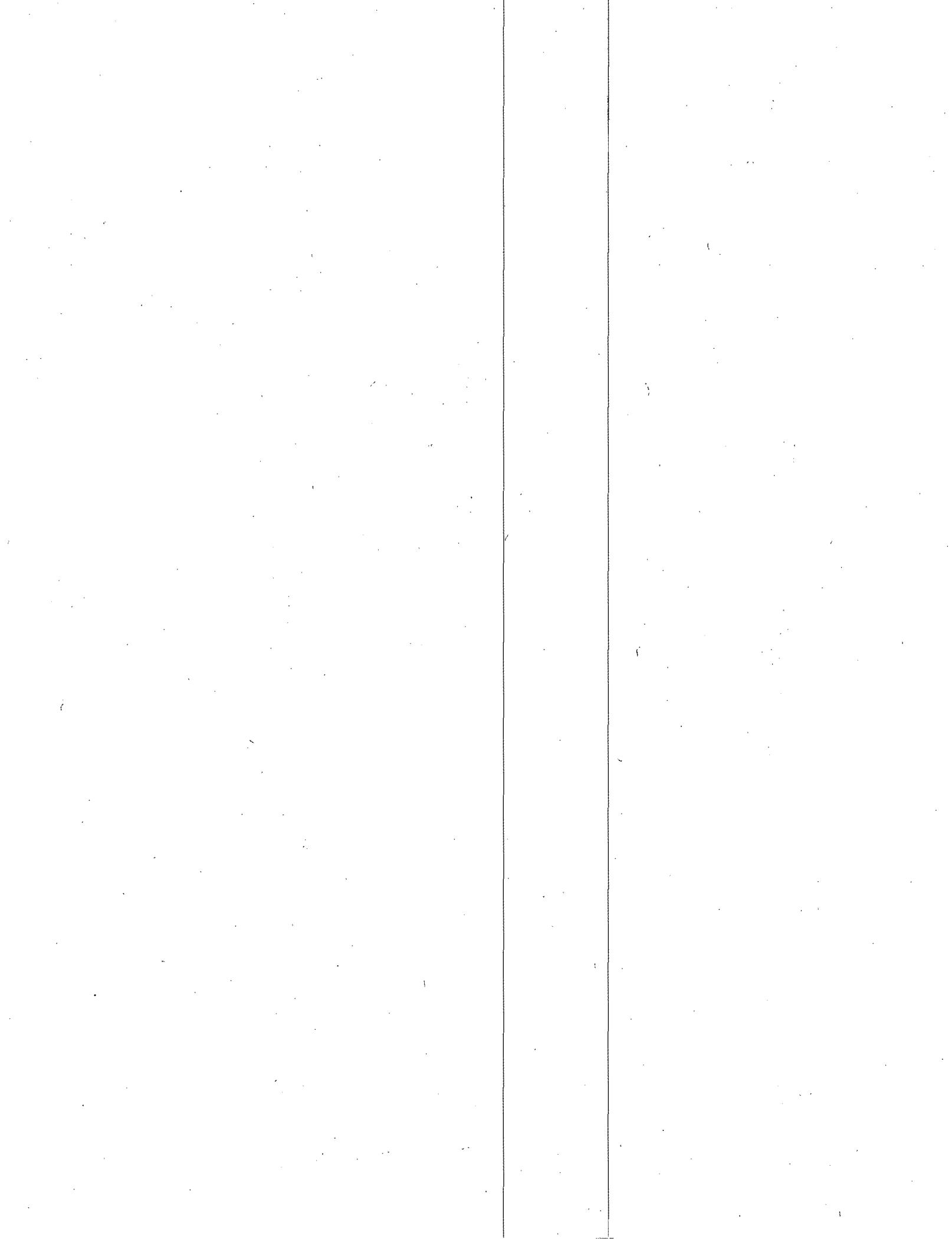
PSH = Phase separated hydrocarbons

ND = Not detected

NG = Not gauged

Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

$$\text{Potentiometric Surface Elevation} = \text{Top of Casing Elevation} - \text{Depth to Water} + (\text{Specific Gravity of PSH} \times \text{PSH Thickness})$$



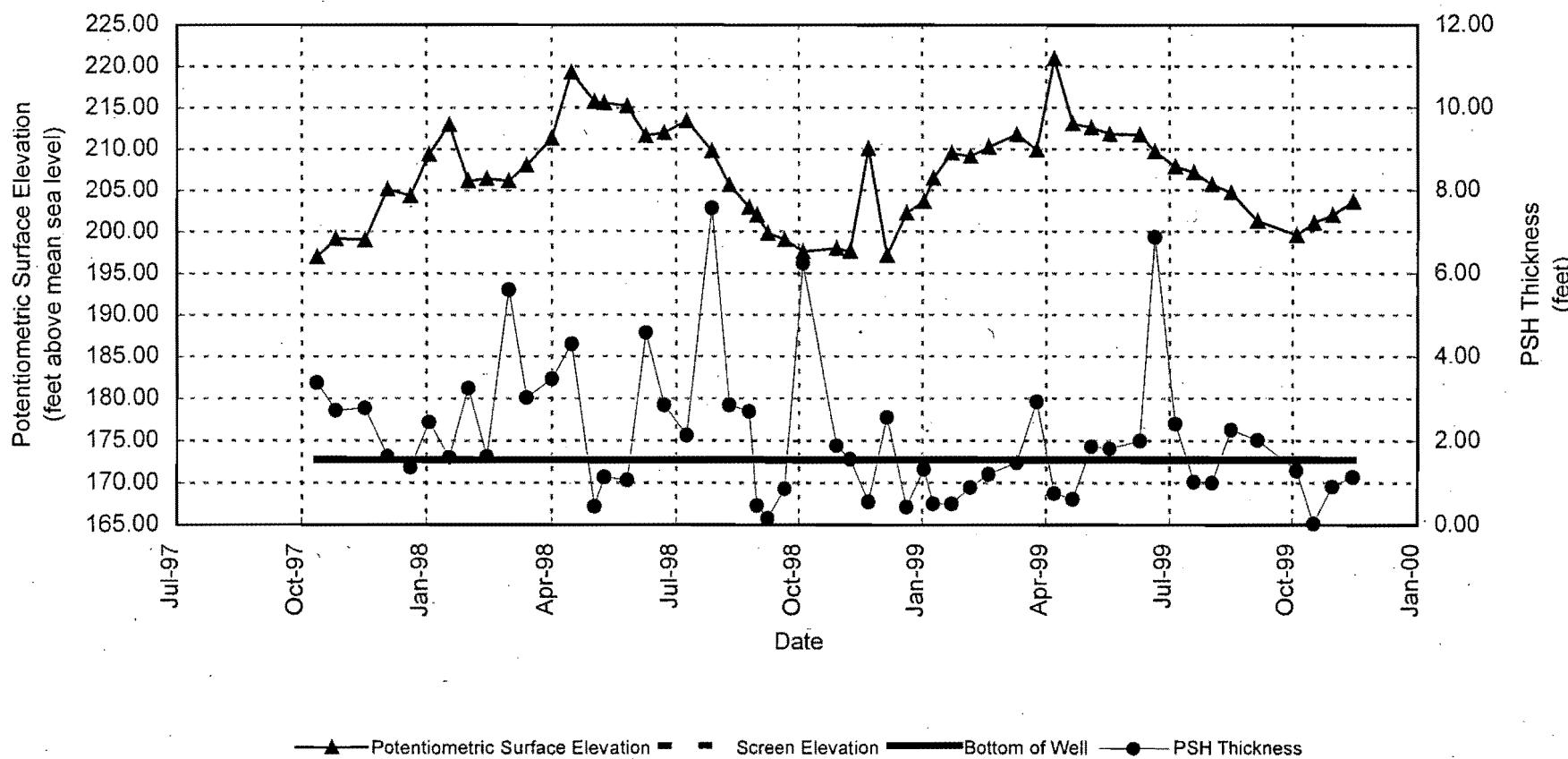
MONITORING DATA VS. TIME

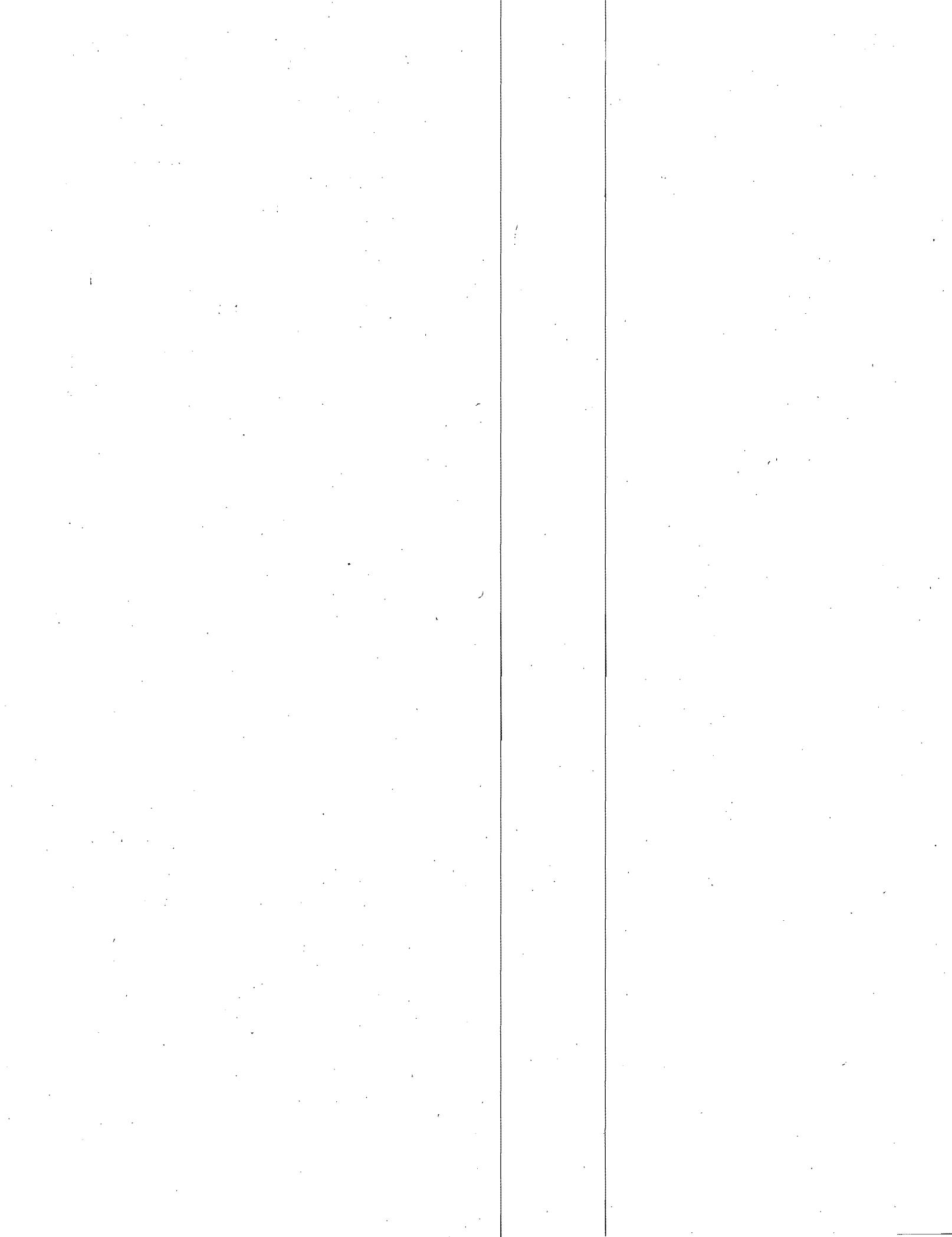
G-5

WILLIAMS REFINING, L.L.C.

543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE

TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:				
		Top of Casing Elevation	225.78	PSH S.G.	0.8468
		Depth to Screen	11.00		
OW-12		Well Depth	60.00		Assumed, based on S.G. of LNAPL measured in OW-16 (10/99)
Measurements in Feet					
Monitoring Date	Notes	Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
10/20/97		27.19	27.78	0.59	198.50
11/03/97		27.49	28.18	0.69	198.18
11/25/97		27.32	28.42	1.10	198.29
12/12/97		27.78	28.77	0.99	197.85
12/29/97		27.34	28.40	1.06	198.28
01/12/98		27.28	27.63	0.35	198.45
01/27/98		24.75	25.13	0.38	200.97
02/10/98		25.81	26.16	0.35	199.92
02/24/98		23.96	24.29	0.33	201.77
03/12/98		23.10	23.32	0.22	202.65
03/25/98		21.80	22.00	0.20	203.95
04/13/98		ND	20.48	ND	205.30
04/28/98		ND	17.69	ND	208.09
05/15/98		16.60	16.61	0.01	209.18
05/22/98		16.55	16.56	0.01	209.23
06/08/98		22.62	22.70	0.08	203.15
06/22/98		19.67	19.75	0.08	206.10
07/06/98		18.83	18.93	0.10	206.93
07/23/98		19.62	19.78	0.16	206.14
08/11/98		20.60	20.80	0.20	205.15
08/24/98		NG	NG	NG	
09/08/98		ND	24.38	ND	201.40
09/14/98		25.02	26.06	1.04	200.60
09/22/98		26.05	26.15	0.10	199.71
10/05/98		26.65	26.98	0.33	199.08
10/19/98		26.95	27.45	0.50	198.75
11/13/98		27.33	27.87	0.54	198.37
11/23/98		27.02	27.68	0.66	198.66
12/07/98		27.82	28.40	0.58	197.87
12/21/98		27.21	27.80	0.59	198.48
01/05/99		27.31	27.96	0.65	198.37
01/18/99		26.66	27.32	0.66	199.02
01/25/99		25.43	25.90	0.47	200.28
02/08/99		21.42	21.47	0.05	204.35
02/22/99		20.56	20.63	0.07	205.21
03/08/99		21.67	21.76	0.09	204.10
03/29/99		20.21	20.33	0.12	205.55
04/13/99		22.01	22.37	0.36	203.71
04/26/99		20.68	20.83	0.15	205.08
05/10/99		20.35	20.48	0.13	205.41
05/24/99		21.36	21.57	0.21	204.39
06/07/99		22.27	22.86	0.59	203.42
06/30/99		23.25	23.97	0.72	202.42
07/11/99		23.27	24.00	0.73	202.40
07/26/99		24.84	25.82	0.98	200.79
08/09/99		25.40	26.38	0.98	200.23
08/23/99		26.49	27.64	1.15	199.11
09/07/99		27.78	27.93	0.15	197.98
09/27/99		29.05	29.30	0.25	196.69
10/26/99		30.14	30.47	0.33	195.59
11/08/99		30.50	30.95	0.45	195.21
11/22/99		31.05	31.55	0.50	194.65
12/07/99		31.32	31.90	0.58	194.37

Notes:

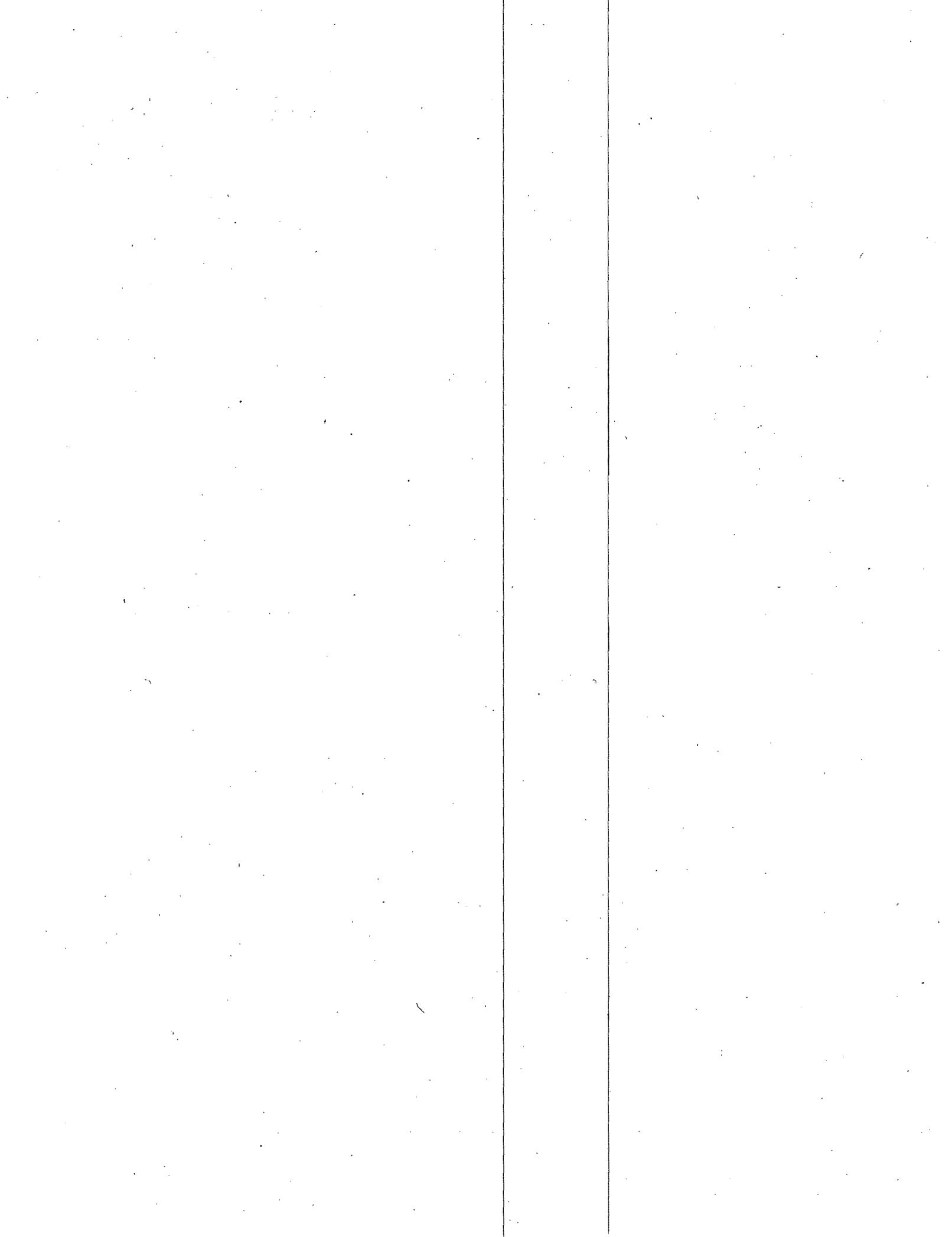
PSH = Phase separated hydrocarbons

ND = Not detected

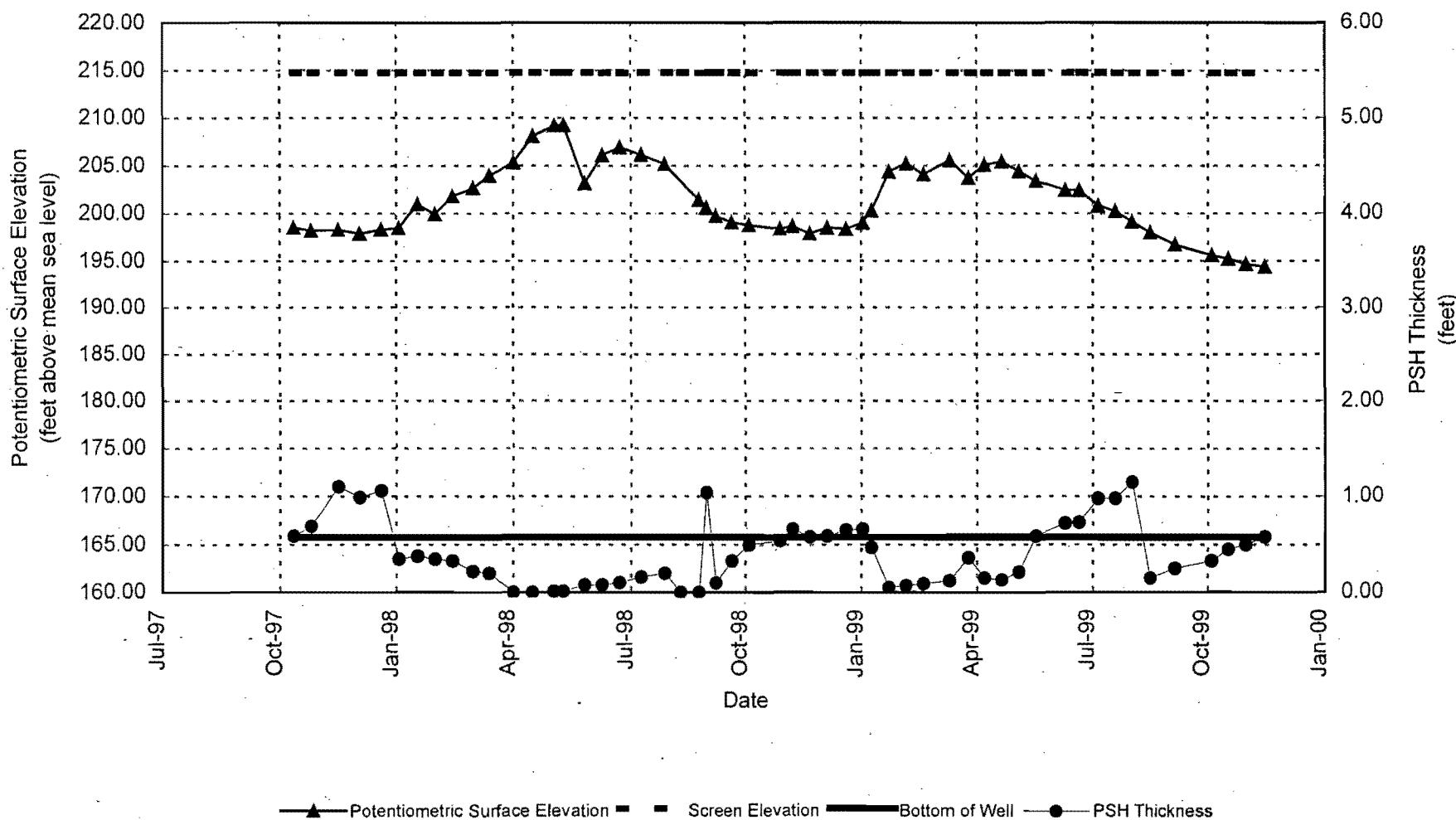
NG = Not gauged

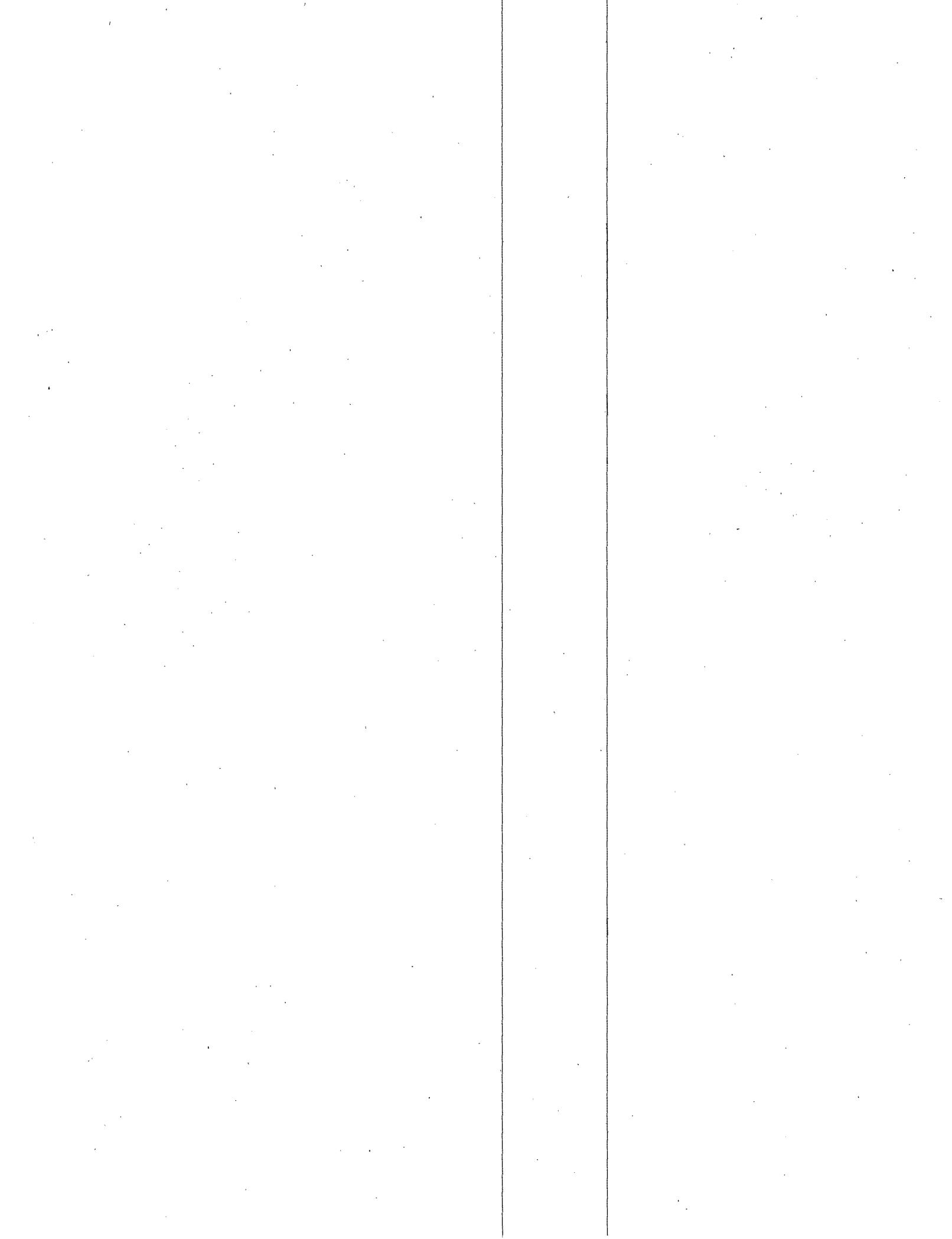
Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

$$\text{Potentiometric Surface Elevation} = \text{Top of Casing Elevation} - \text{Depth to Water} + (\text{Specific Gravity of PSH} \times \text{PSH Thickness})$$



MONITORING DATA VS. TIME
OW-12
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE
TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well: OW-14	Construction:	Top of Casing Elevation	216.78	PSH S.G. 0.8265	Assumed, based on S.G. of LNAPL measured in RW-8 (10/99)
		Depth to Screen	20.00		
		Well Depth	60.00		
Measurements in Feet					
Monitoring Date	Notes	Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
10/20/97		10.00	10.64	0.64	206.67
11/03/97		9.78	10.42	0.64	206.89
11/25/97		10.89	11.53	0.64	205.78
12/12/97		13.00	13.68	0.68	203.66
12/29/97		9.38	14.13	4.75	206.58
01/12/98		8.95	8.96	0.01	207.83
01/27/98		6.39	6.41	0.02	210.39
02/10/98		8.19	8.20	0.01	208.59
02/24/98		ND	5.65	ND	211.13
03/12/98		ND	5.15	ND	211.63
03/25/98		ND	4.75	ND	212.03
04/13/98		ND	4.70	ND	212.08
04/28/98		ND	3.45	ND	213.33
05/15/98		ND	2.00	ND	214.78
05/22/98		ND	2.67	ND	214.11
06/08/98		ND	4.83	ND	211.95
06/22/98		ND	4.83	ND	211.95
07/06/98		ND	5.10	ND	211.68
07/23/98		ND	4.38	ND	212.40
08/11/98		ND	4.31	ND	212.47
08/24/98		NG	NG	NG	
09/08/98		ND	8.58	ND	208.20
09/14/98		ND	10.00	ND	206.78
09/22/98		ND	13.02	ND	203.76
10/05/98		ND	15.48	ND	201.30
10/19/98		ND	14.12	ND	202.66
11/13/98		15.61	15.65	0.04	201.16
11/23/98		13.69	13.76	0.07	203.08
12/07/98		12.50	12.62	0.12	204.26
12/21/98		8.88	8.98	0.10	207.88
01/05/99		9.28	9.36	0.08	207.49
01/18/99		8.51	8.61	0.10	208.25
01/25/99		6.65	6.74	0.09	210.11
02/08/99		3.74	3.77	0.03	213.03
02/22/99		ND	4.43	ND	212.35
03/08/99		5.70	5.73	0.03	211.07
03/29/99		4.20	4.25	0.05	212.57
04/13/99		5.56	5.57	0.01	211.22
04/26/99		4.17	4.18	0.01	212.61
05/10/99		ND	3.61	ND	213.17
05/24/99		5.10	5.13	0.03	211.67
06/07/99		6.36	6.38	0.02	210.42
06/30/99		7.23	7.25	0.02	209.55
07/11/99		ND	6.97	ND	209.81
07/26/99		ND	9.10	ND	207.68
08/09/99		ND	12.92	ND	203.86
08/23/99		15.82	15.84	0.02	200.96
09/07/99		16.50	16.55	0.05	200.27
09/27/99		17.66	17.75	0.09	199.10
10/26/99		18.38	18.55	0.17	198.37
11/08/99		18.60	19.07	0.47	198.10
11/22/99		18.17	19.70	1.53	198.34
12/07/99		17.50	18.40	0.90	199.12

Notes:

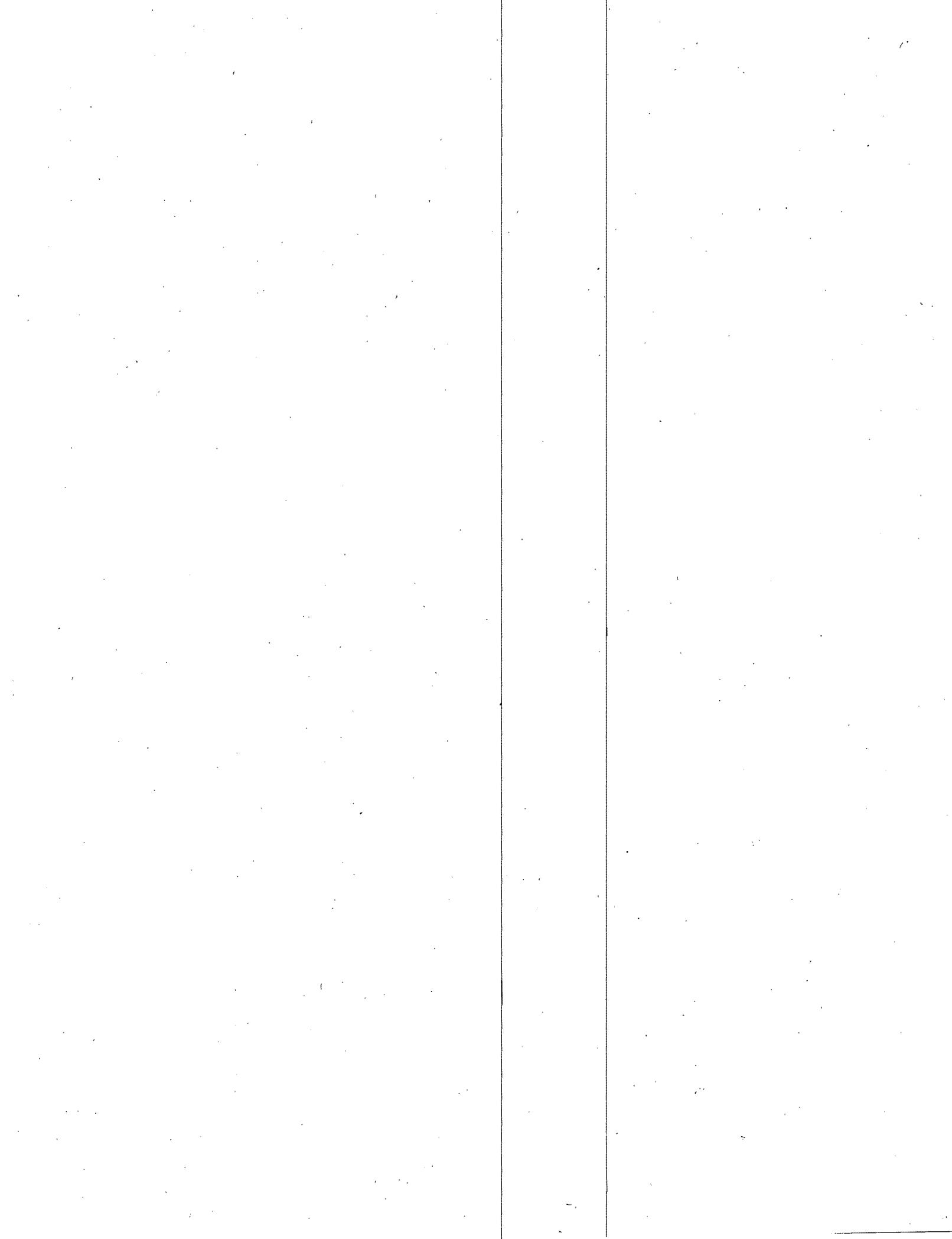
PSH = Phase separated hydrocarbons

ND = Not detected

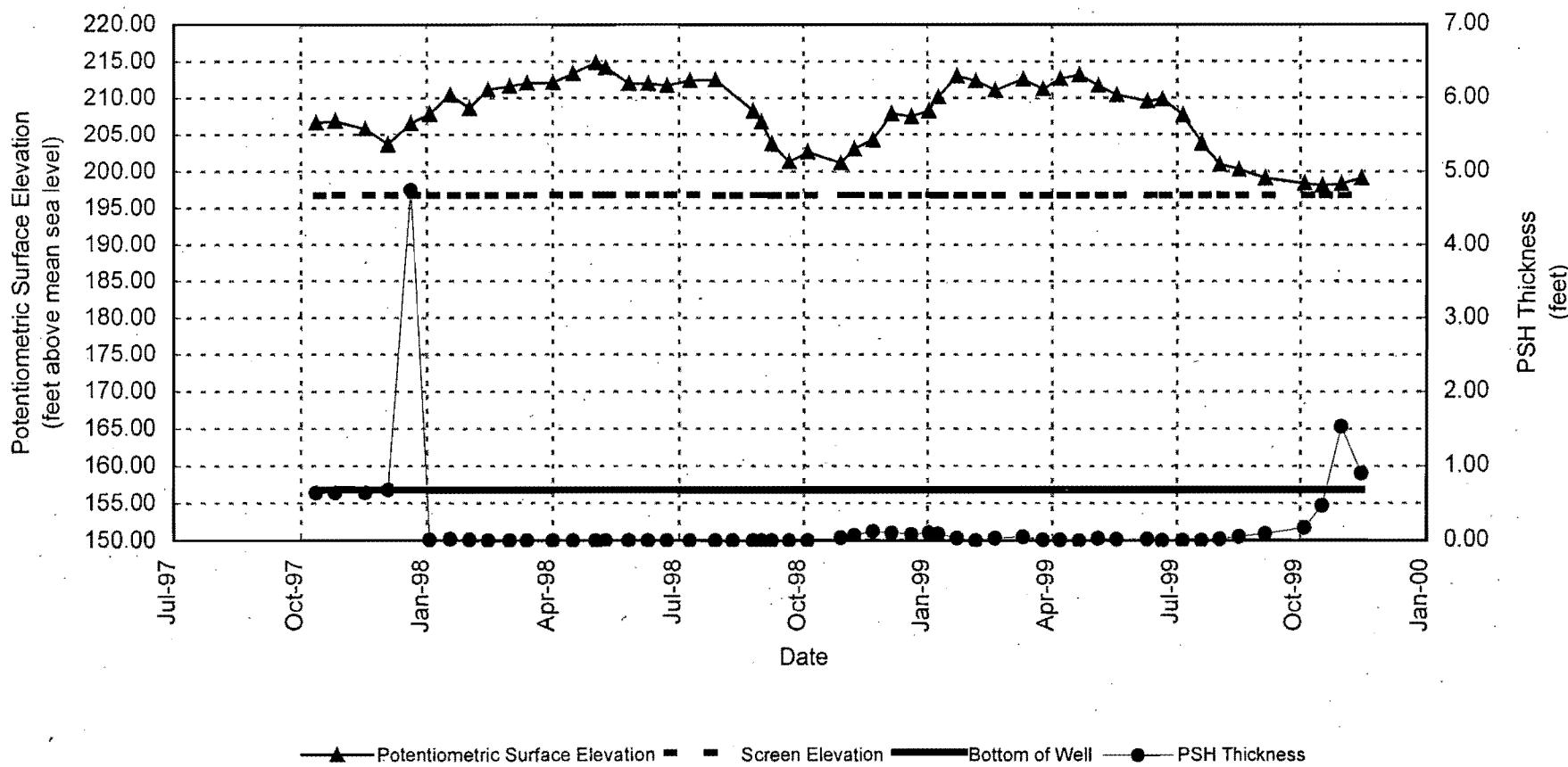
NG = Not gauged

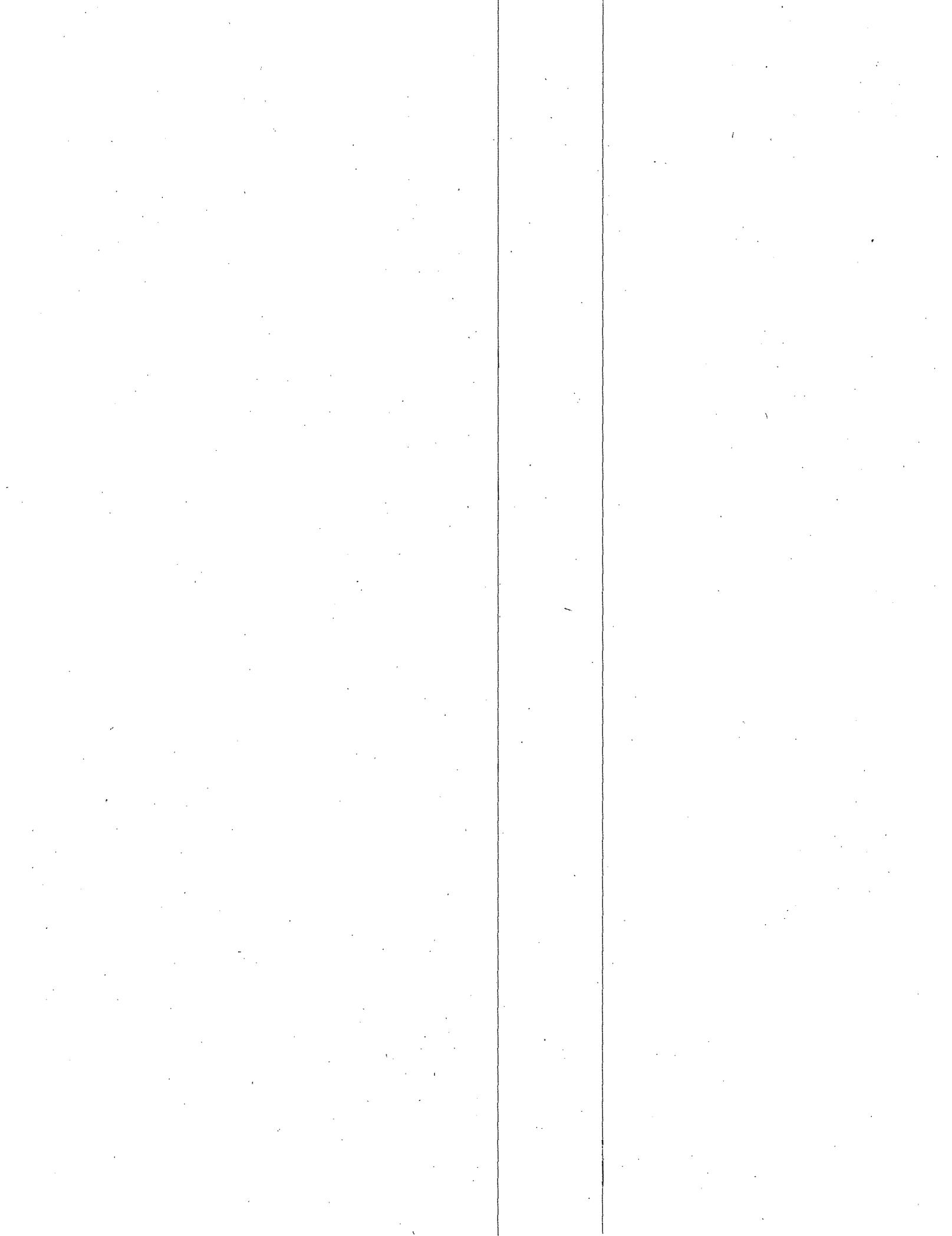
Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

$$\text{Potentiometric Surface Elevation} = \text{Top of Casing Elevation} - \text{Depth to Water} + (\text{Specific Gravity of PSH} \times \text{PSH Thickness})$$



MONITORING DATA VS. TIME
OW-14
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE
TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:	Measurements in Feet			
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
OW-16		Top of Casing Elevation	226.38	PSH S.G.	0.8468 Assumed, based on S.G. of LNAPL measured in OW-16 (10/99)
		Depth to Screen	12.00		
		Well Depth	60.00		
10/21/97		ND	31.54	ND	194.84
11/03/97		ND	32.14	ND	194.24
11/24/97		ND	32.55	ND	193.83
12/12/97		ND	32.91	ND	193.47
12/29/97		ND	32.38	ND	194.00
01/12/98		ND	30.06	ND	196.32
01/27/98		ND	30.30	ND	196.08
02/10/98		26.56	27.69	1.13	199.65
02/24/98		ND	25.99	ND	200.39
03/12/98		ND	22.90	ND	203.48
03/24/98		21.69	21.70	0.01	204.69
04/13/98		ND	20.49	ND	205.89
04/28/98		19.83	19.84	0.01	206.55
05/15/98		19.02	19.03	0.01	207.36
05/21/98		19.13	19.14	0.01	207.25
06/08/98		23.79	24.28	0.49	202.51
06/22/98		22.64	23.15	0.51	203.66
07/06/98		21.68	22.15	0.47	204.63
07/23/98		21.90	22.40	0.50	204.40
08/11/98		ND	23.12	ND	203.26
08/24/98		NG	NG	NG	
09/08/98		ND	27.31	ND	199.07
09/14/98		27.98	28.51	0.53	198.32
09/22/98		28.55	28.93	0.38	197.77
10/05/98		29.04	29.52	0.48	197.27
10/19/98		29.39	29.87	0.48	196.92
11/13/98		29.73	30.20	0.47	196.58
11/23/98		29.63	30.10	0.47	196.68
12/07/98		30.25	30.70	0.45	196.06
12/21/98		29.60	30.05	0.45	196.71
01/05/99		29.52	29.96	0.44	196.79
01/18/99		29.00	29.45	0.45	197.31
01/25/99		27.78	28.22	0.44	198.53
02/08/99		ND	23.16	ND	203.22
02/22/99		ND	22.01	ND	204.37
03/08/99		23.33	23.41	0.08	203.04
03/29/99		21.95	22.13	0.18	204.40
04/13/99		ND	21.00	ND	205.38
04/26/99		ND	19.20	ND	207.18
05/10/99		ND	18.70	ND	207.68
05/24/99		19.85	20.53	0.68	206.43
06/07/99		22.28	23.13	0.85	203.97
06/30/99		23.01	23.91	0.90	203.23
07/11/99		22.92	23.76	0.84	203.33
07/26/99		24.38	25.22	0.84	201.87
08/09/99		24.75	25.55	0.80	201.51
08/23/99		25.81	26.60	0.79	200.45
09/07/99		26.70	27.50	0.80	199.56
09/27/99		27.73	28.46	0.73	198.54
10/26/99		NG	NG		
11/08/99		29.62	29.76	0.14	196.74
11/22/99		NG	NG		
12/07/99		NG	NG		

Notes:

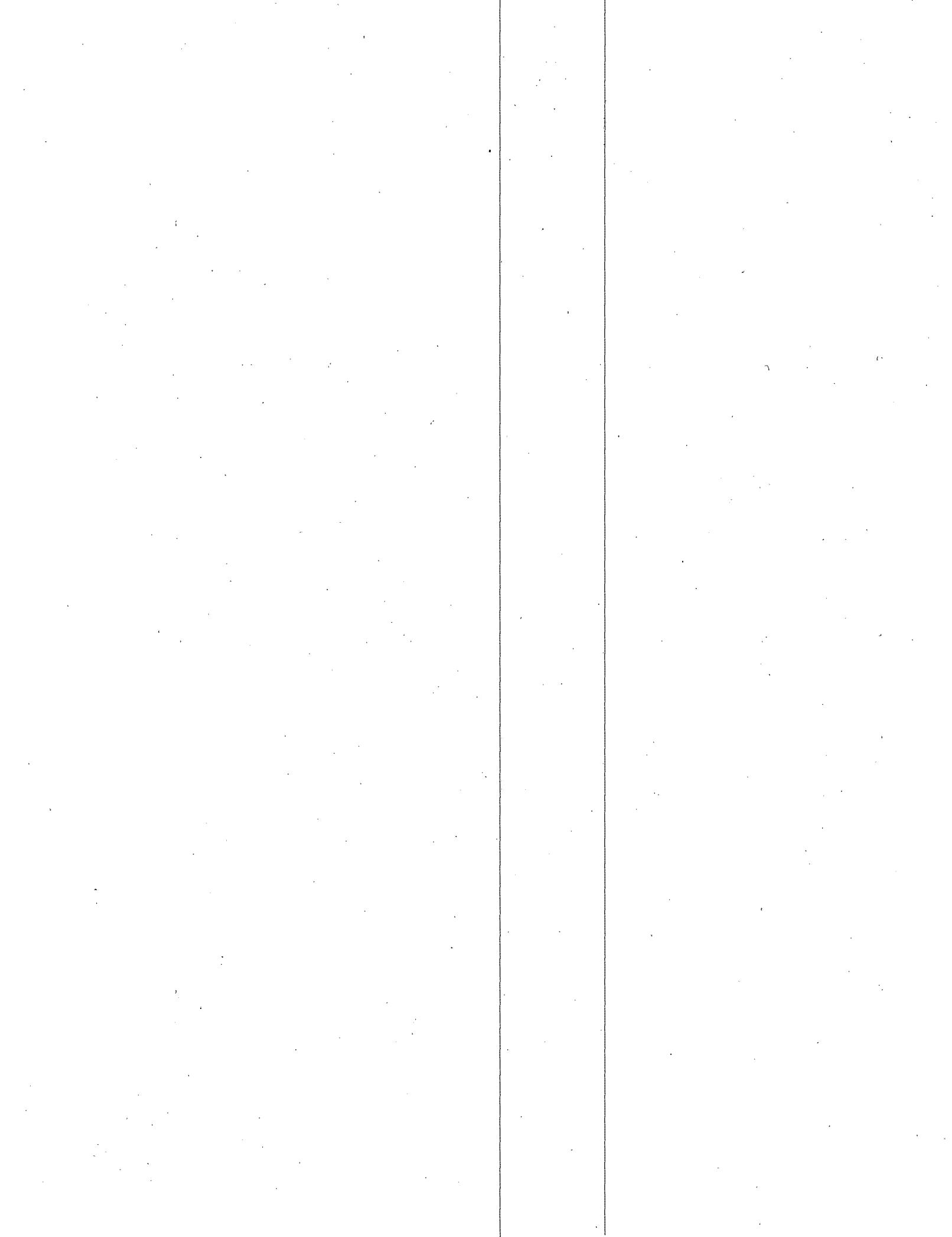
PSH = Phase separated hydrocarbons

ND = Not detected

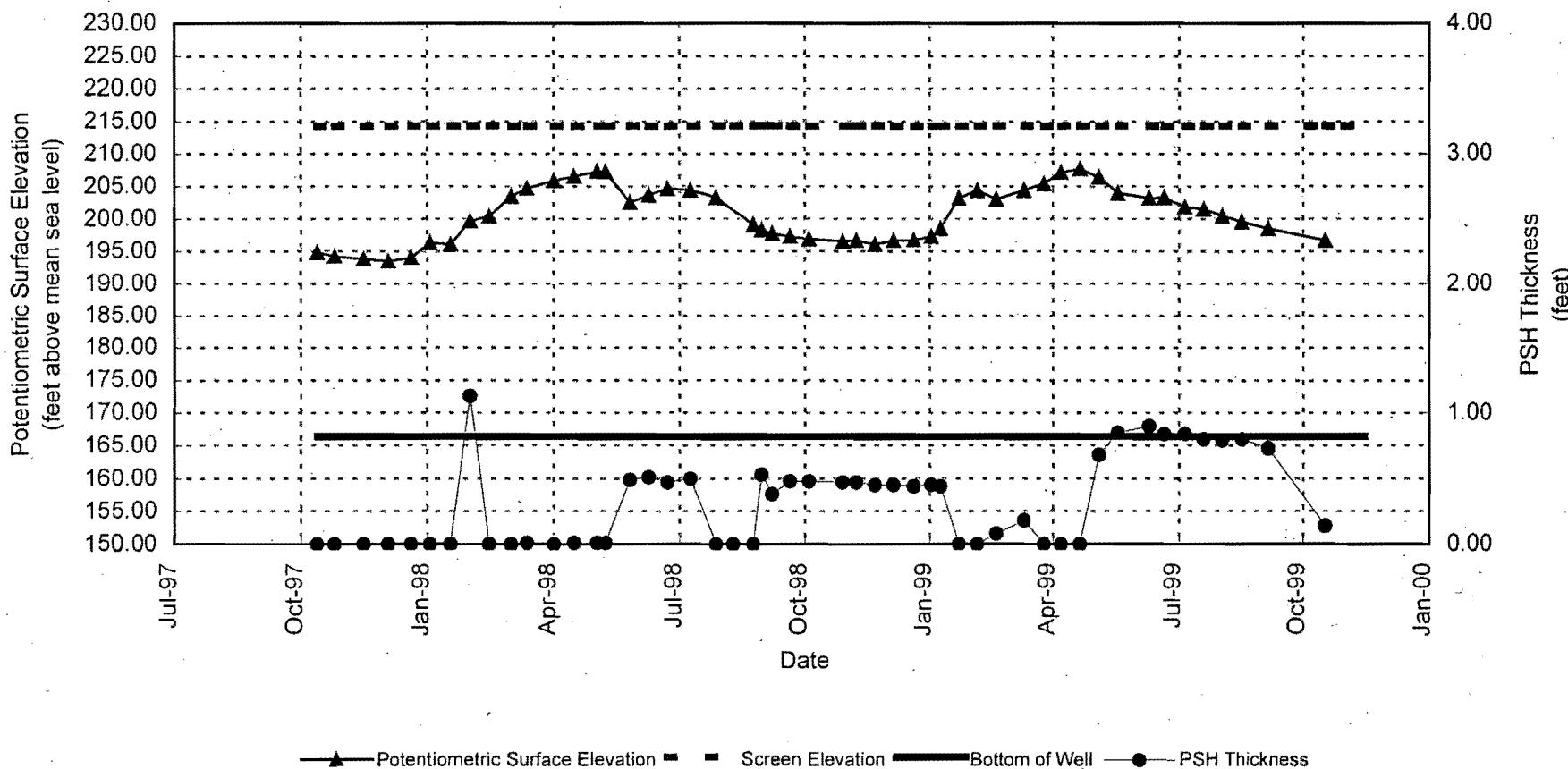
NG = Not gauged

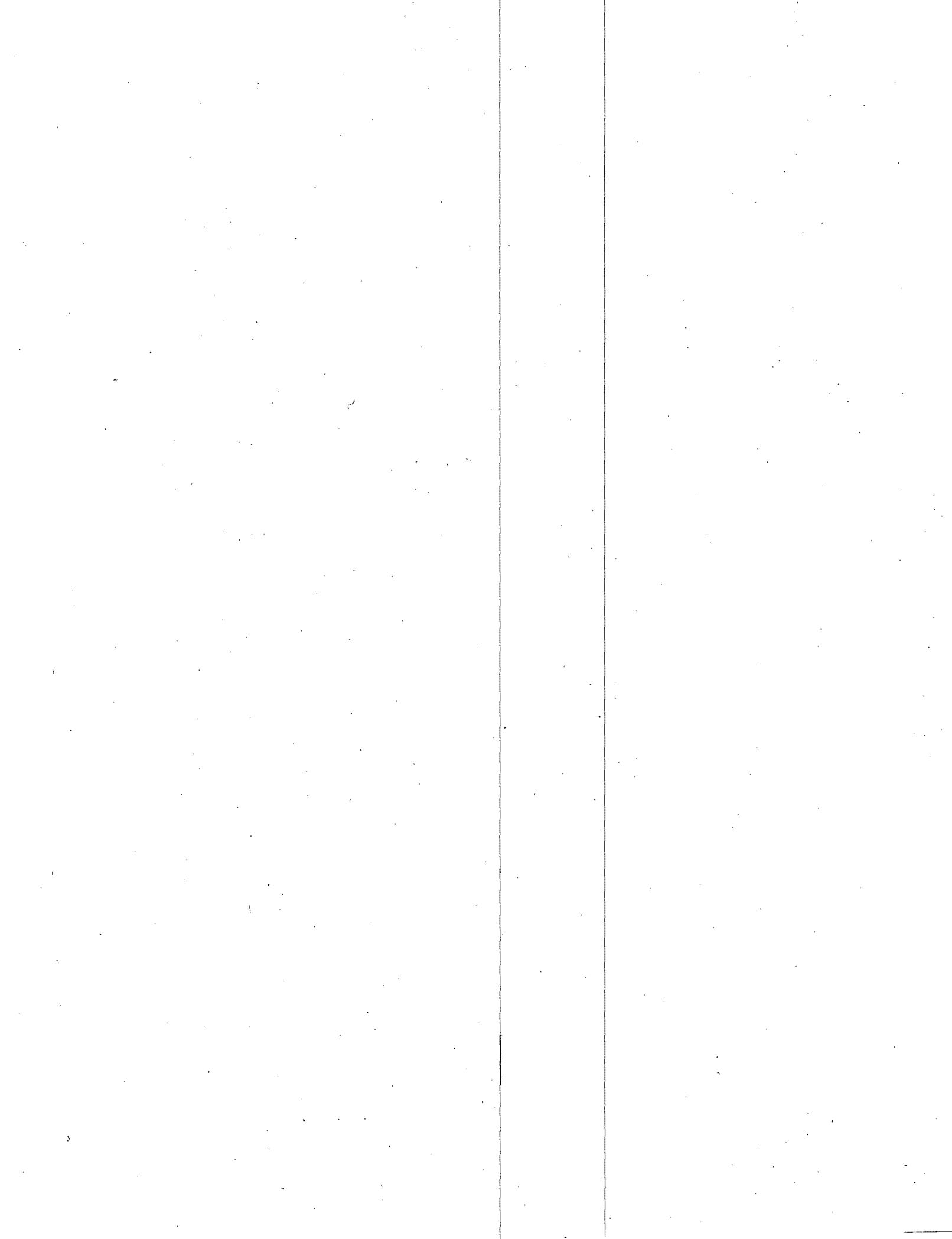
Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

$$\text{Potentiometric Surface Elevation} = \text{Top of Casing Elevation} - \text{Depth to Water} + (\text{Specific Gravity of PSH} \times \text{PSH Thickness})$$



MONITORING DATA VS. TIME
OW-16
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE
TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well: OW-17	Construction:	Top of Casing Elevation	221.23	PSH S.G. 0.80	Assumed, LNAPL not measured in area
		Depth to Screen	12.00		
		Well Depth	60.00		
Measurements in Feet					
Monitoring Date	Notes	Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
10/21/97		28.72	29.46	0.74	192.36
11/03/97		28.80	29.58	0.78	192.27
11/24/97		28.36	28.90	0.54	192.76
12/12/97		28.51	29.01	0.50	192.62
12/29/97		28.10	28.58	0.48	193.03
01/12/98		25.90	26.21	0.31	195.27
01/27/98		21.00	21.25	0.25	200.18
02/10/98		24.30	24.38	0.08	196.91
02/24/98		18.40	18.42	0.02	202.83
03/12/98		19.72	19.80	0.08	201.49
03/24/98		ND	17.31	ND	203.92
04/13/98		ND	16.74	ND	204.49
04/28/98		ND	11.71	ND	209.52
05/15/98		ND	10.65	ND	210.58
05/21/98		ND	12.90	ND	208.33
06/08/98		20.20	20.37	0.17	201.00
06/22/98		ND	15.63	ND	205.60
07/06/98		ND	15.62	ND	205.61
07/23/98		19.25	19.27	0.02	201.98
08/11/98		21.10	21.30	0.20	200.09
08/24/98		NG	NG	NG	
09/08/98		ND	26.24	ND	194.99
09/14/98		26.93	27.18	0.25	194.25
09/22/98		24.34	24.60	0.26	196.84
10/05/98		27.83	28.10	0.27	193.35
10/19/98		26.95	27.15	0.20	194.24
11/13/98		27.48	27.66	0.18	193.71
11/23/98		26.17	26.42	0.25	195.01
12/07/98		28.08	28.42	0.34	193.08
12/21/98		26.32	26.52	0.20	194.87
01/05/99		27.15	27.37	0.22	194.04
01/18/99		23.95	24.05	0.10	197.26
01/25/99		19.80	19.93	0.13	201.40
02/08/99		ND	13.05	ND	208.18
02/22/99		ND	16.55	ND	204.68
03/08/99		19.68	19.72	0.04	201.54
03/29/99		12.52	13.31	0.79	208.55
04/13/99		ND	20.95	ND	200.28
04/26/99		ND	17.75	ND	203.48
05/10/99		ND	16.15	ND	205.08
05/24/99		ND	19.66	ND	201.57
06/07/99		20.50	20.52	0.02	200.73
06/30/99		ND	22.62	ND	198.61
07/11/99		21.66	21.76	0.10	199.55
07/26/99		25.99	26.08	0.09	195.22
08/09/99		25.55	25.62	0.07	195.67
08/23/99		27.67	27.84	0.17	193.53
09/07/99		28.45	28.62	0.17	192.75
09/27/99		29.50	29.90	0.40	191.65
10/26/99		29.96	30.45	0.49	191.17
11/08/99		30.32	30.81	0.49	190.81
11/22/99		30.67	31.15	0.48	190.46
12/07/99		30.46	30.80	0.34	190.70

Notes:

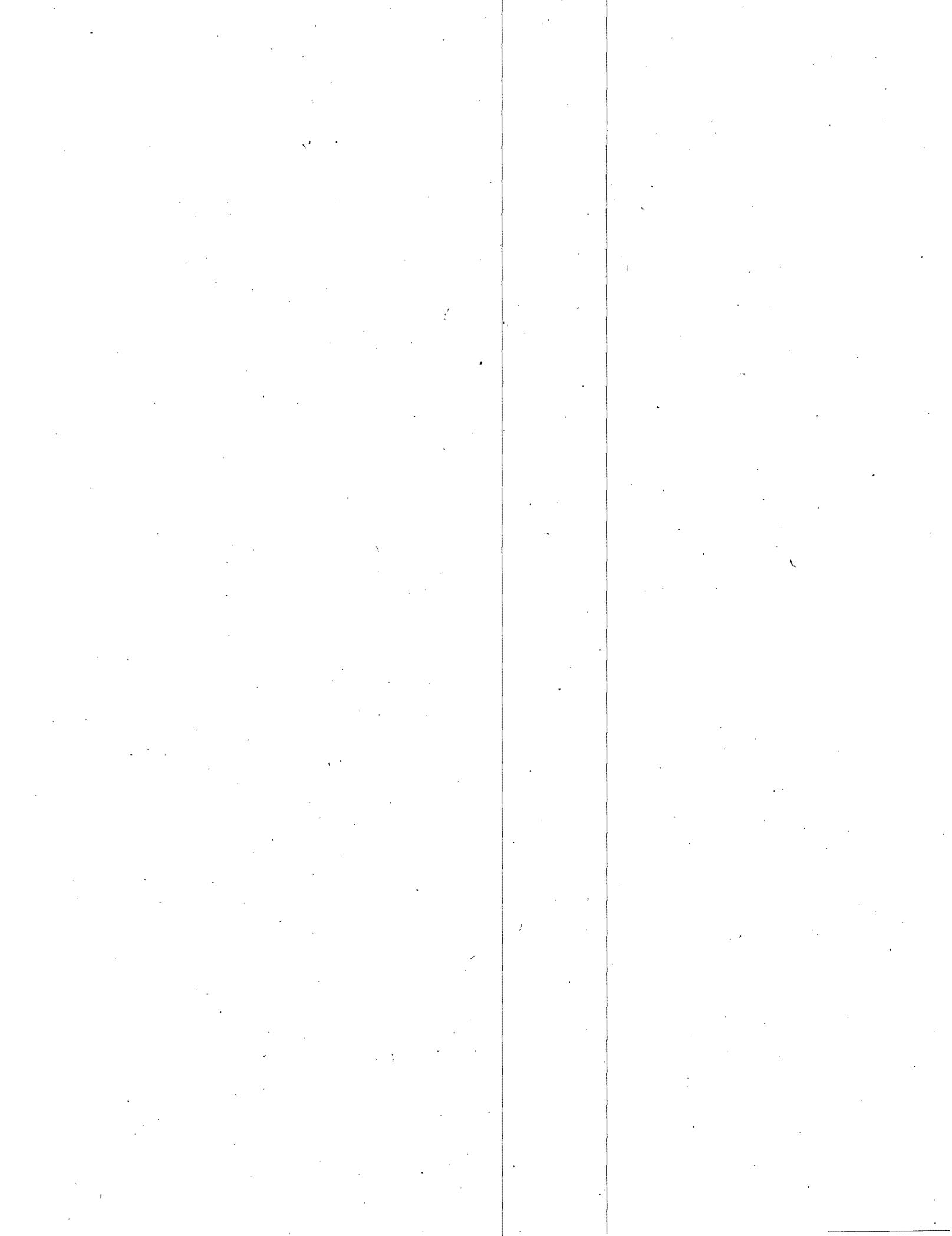
PSH = Phase separated hydrocarbons

ND = Not detected

NG = Not gauged

Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

Potentiometric Surface Elevation = Top of Casing Elevation - Depth to Water + (Specific Gravity of PSH x PSH Thickness)



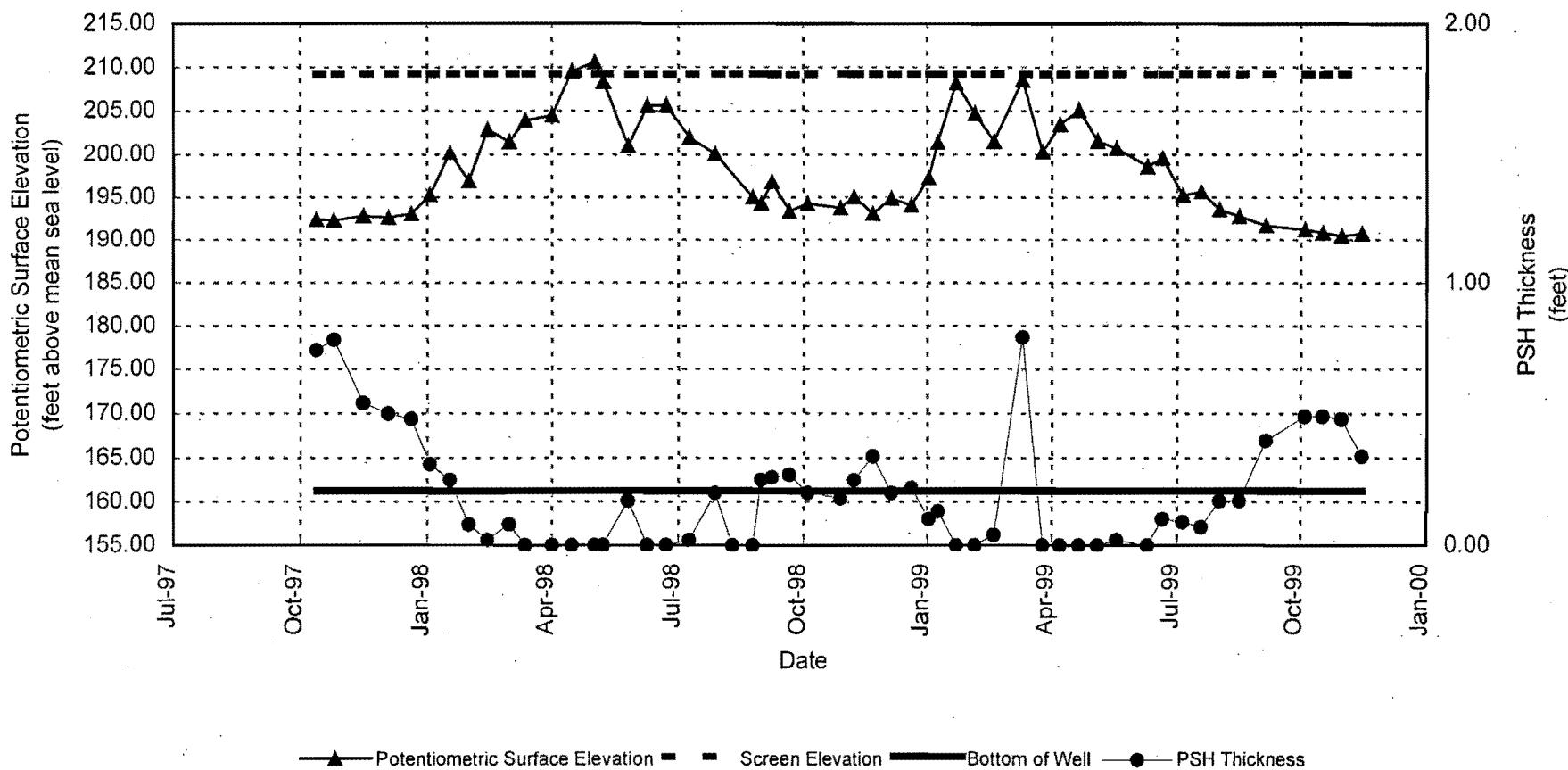
MONITORING DATA VS. TIME

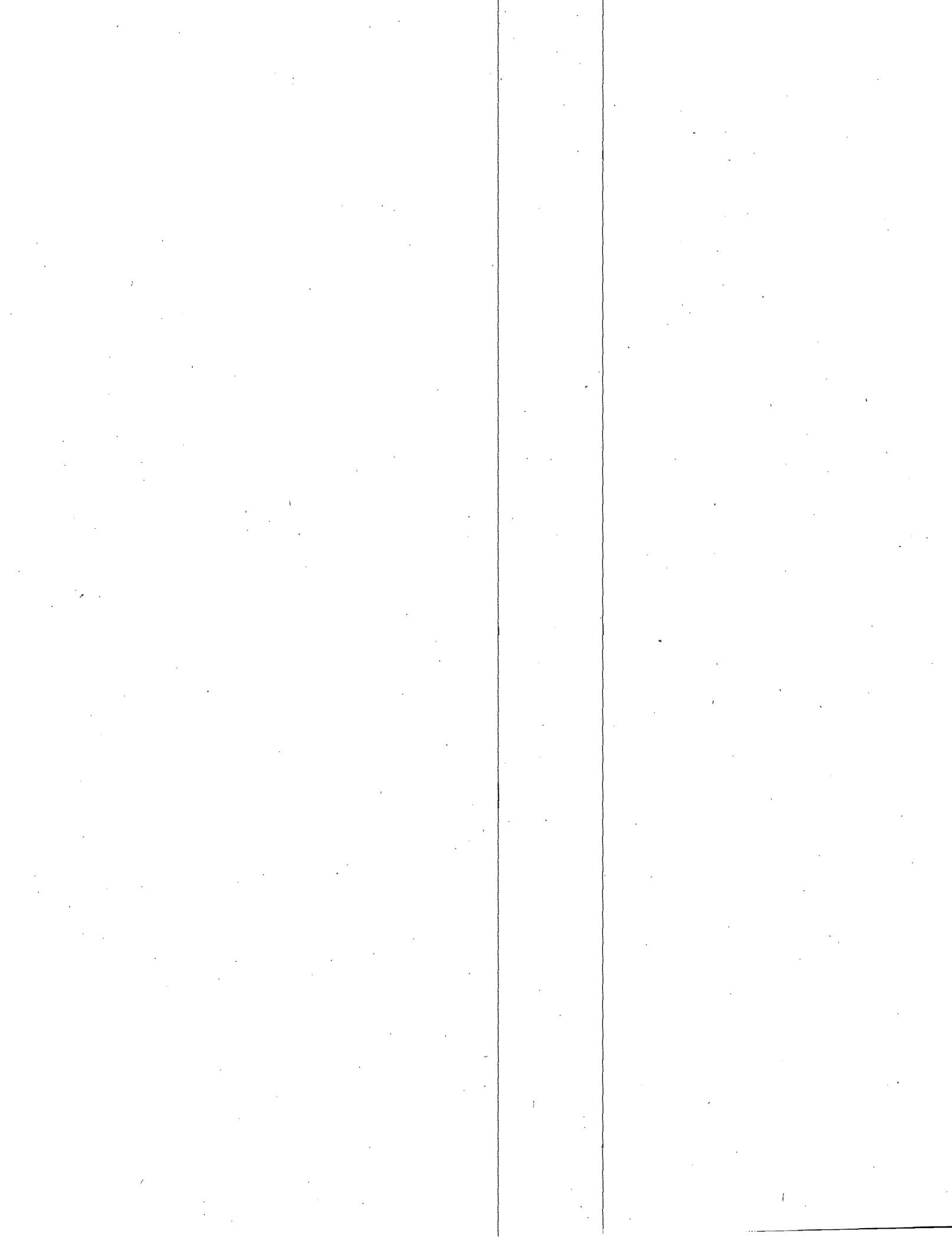
OW-17

WILLIAMS REFINING, L.L.C.

543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE

TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:	Measurements in Feet			
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
OW-22		Top of Casing Elevation Depth to Screen Well Depth	234.21 15.00 65.00	PSH S.G. 0.80	Assumed, LNAPL not measured in area
10/21/97		47.47	48.97	1.50	186.44
11/03/97		47.59	48.76	1.17	186.39
11/24/97		47.41	48.01	0.60	186.68
12/12/97		47.21	47.52	0.31	186.94
12/29/97		46.77	47.23	0.46	187.35
01/12/98		44.88	45.08	0.20	189.29
01/27/98		41.72	41.78	0.06	192.48
02/10/98		41.42	41.44	0.02	192.79
02/24/98		38.56	38.59	0.03	195.64
03/12/98		37.30	37.31	0.01	196.91
03/24/98		34.90	34.91	0.01	199.31
04/13/98		32.44	32.45	0.01	201.77
04/28/98		27.60	27.70	0.10	206.59
05/15/98		ND	24.85	ND	209.36
05/21/98		ND	25.65	ND	208.56
06/08/98		33.69	33.70	0.01	200.52
06/22/98		32.12	32.65	0.53	201.98
07/06/98		30.30	30.43	0.13	203.88
07/23/98		32.51	33.65	1.14	201.47
08/11/98		34.95	45.18	10.23	197.21
08/24/98		NG	NG	NG	
09/08/98		41.75	44.84	3.09	191.84
09/14/98		43.74	43.90	0.16	190.44
09/22/98		ND	44.98	ND	189.23
10/05/98		46.42	46.60	0.18	187.75
10/19/98		45.78	45.85	0.07	188.42
11/13/98		44.57	44.62	0.05	189.63
11/23/98		44.90	44.97	0.07	189.30
12/07/98		46.04	46.18	0.14	188.14
12/21/98		45.29	45.36	0.07	188.91
01/05/99		45.77	45.90	0.13	188.41
01/18/99		44.58	44.65	0.07	189.62
01/25/99		ND	42.14	ND	192.07
02/08/99		35.78	35.79	0.01	198.43
02/22/99		34.35	34.36	0.01	199.86
03/08/99		35.72	36.68	0.96	198.30
03/29/99		33.99	34.00	0.01	200.22
04/13/99		37.20	39.03	1.83	196.64
04/26/99		36.22	36.43	0.21	197.95
05/10/99		34.15	34.16	0.01	200.06
05/24/99		34.66	34.80	0.14	199.52
06/07/99		36.01	36.97	0.96	198.01
06/30/99		38.17	39.10	0.93	195.85
07/11/99		38.48	38.68	0.20	195.69
07/26/99		40.63	41.18	0.55	193.47
08/09/99		42.45	42.57	0.12	191.74
08/23/99		44.56	44.60	0.04	189.64
09/07/99		46.78	46.82	0.04	187.42
09/27/99		49.05	49.16	0.11	185.14
10/26/99		51.09	51.14	0.05	183.11
11/08/99		51.69	51.78	0.09	182.50
11/22/99		ND	52.25	ND	181.96
12/07/99		52.44	52.65	0.21	181.73

Notes:

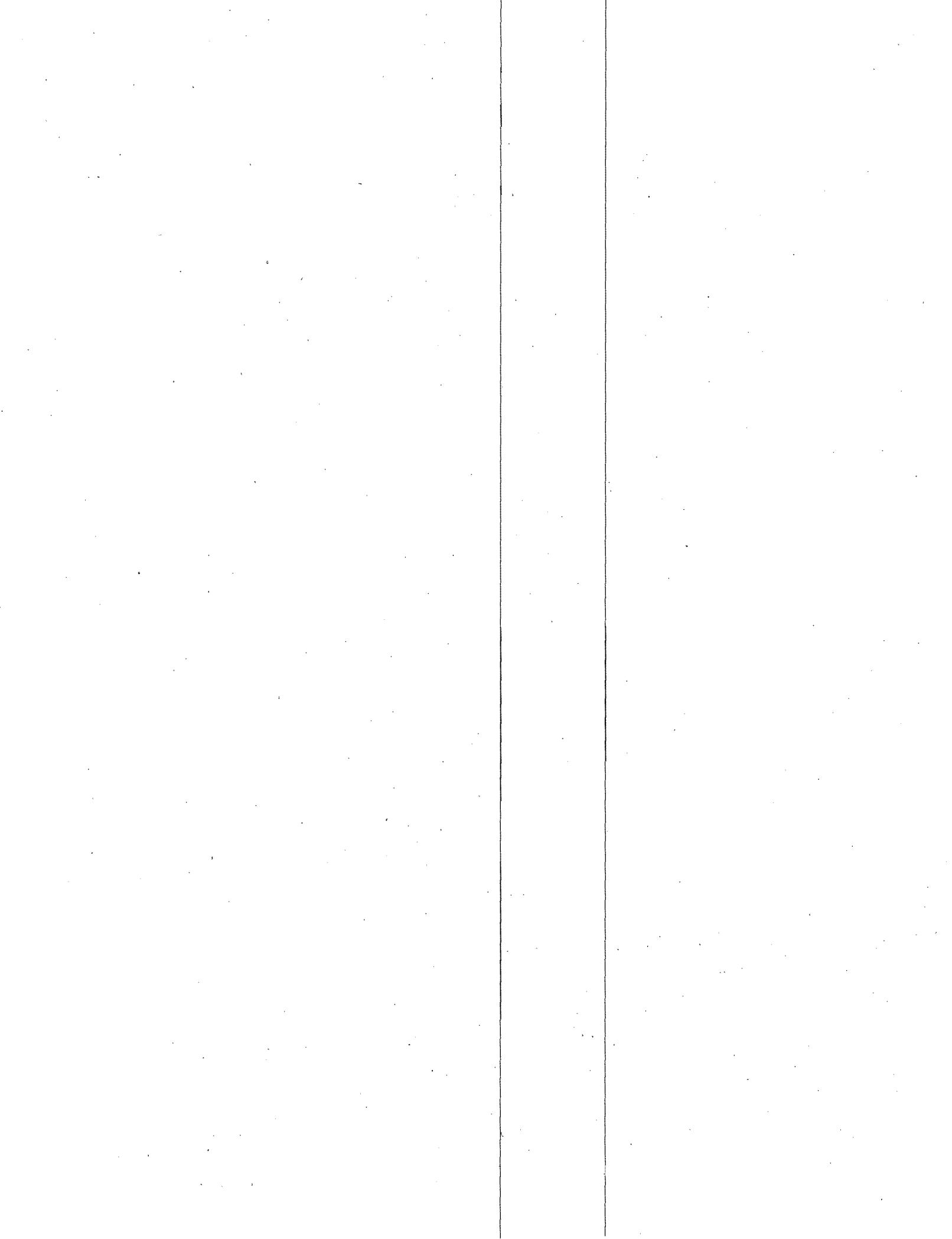
PSH = Phase separated hydrocarbons

ND = Not detected

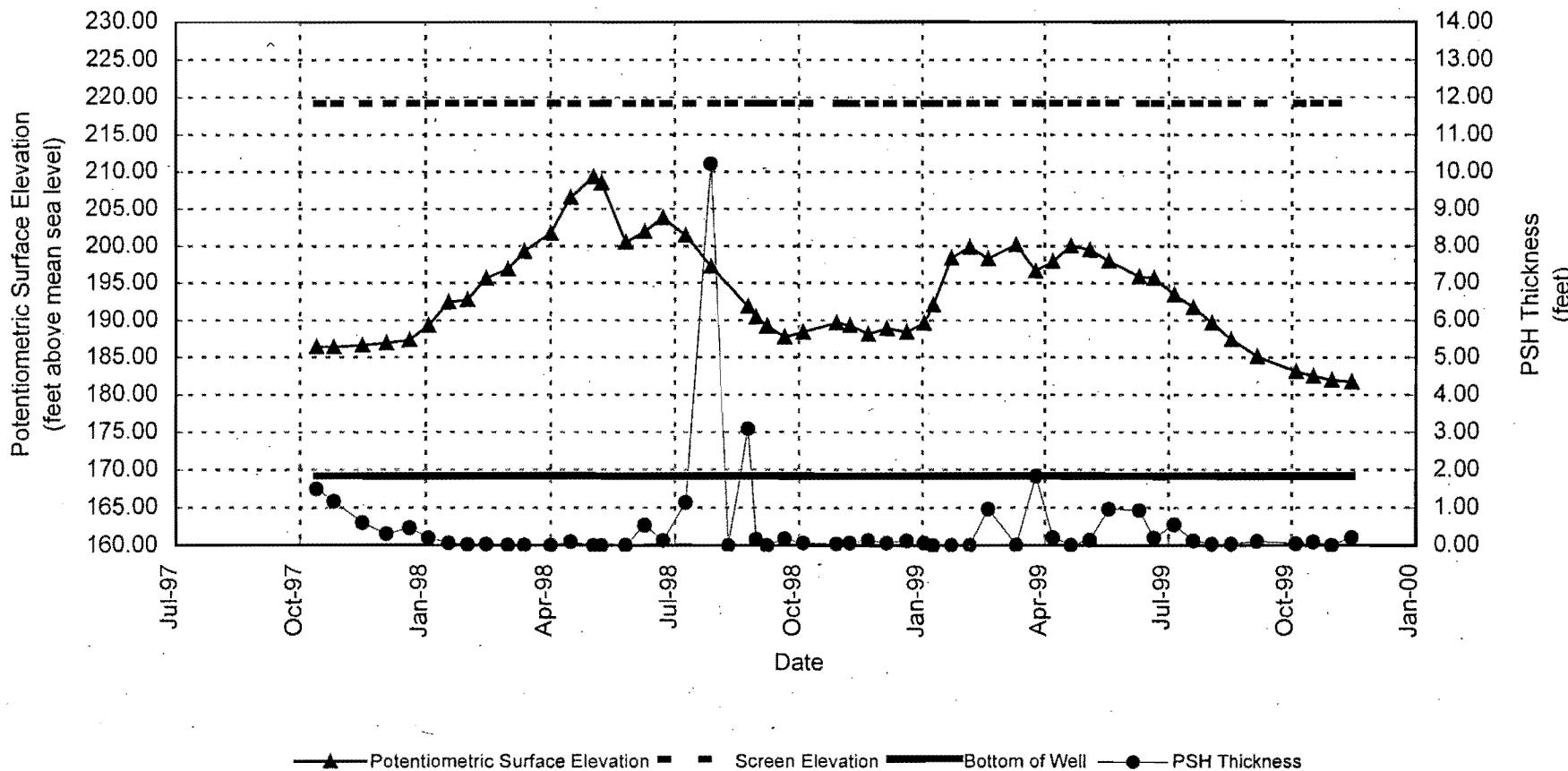
NG = Not gauged

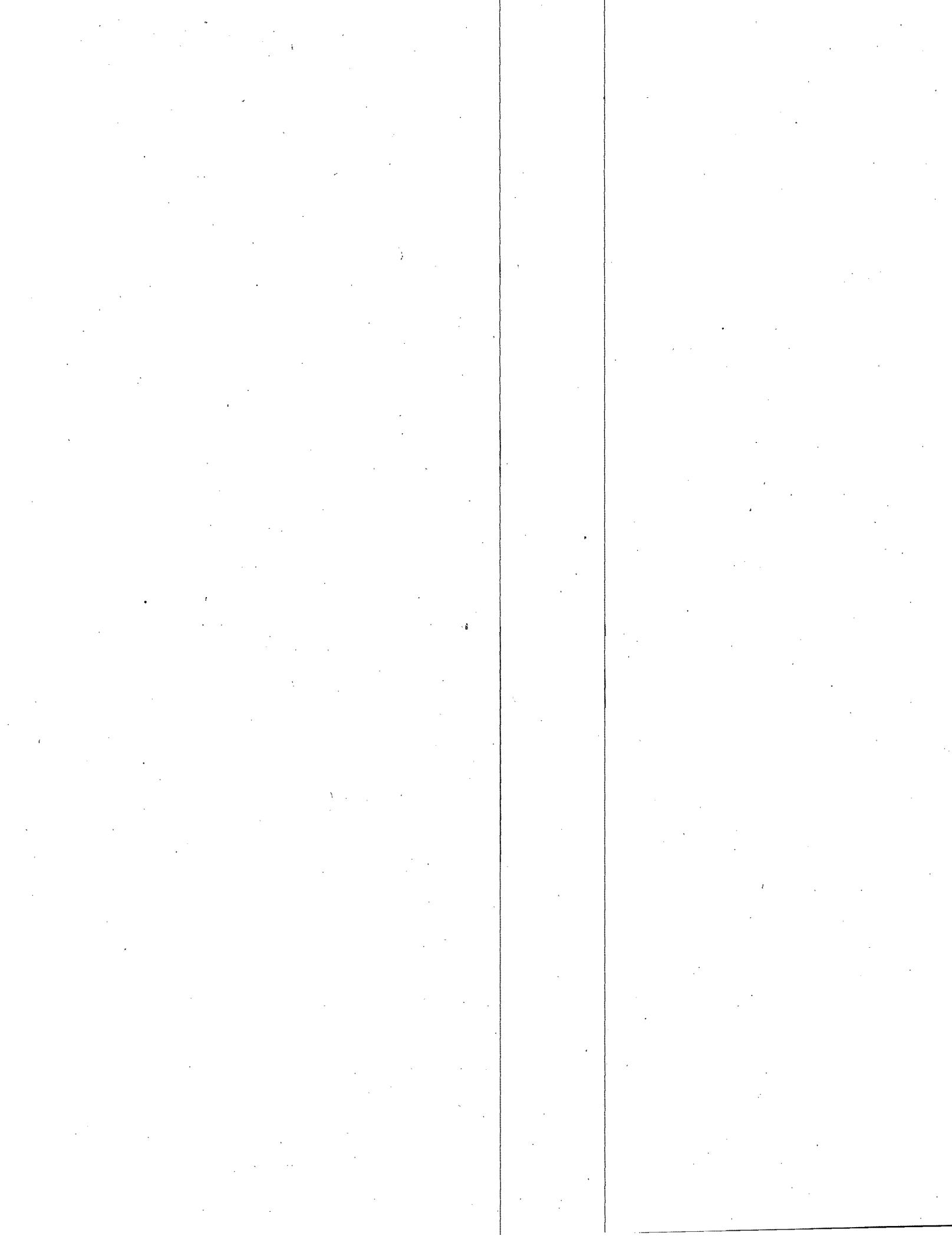
Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

Potentiometric Surface Elevation = Top of Casing Elevation - Depth to Water + (Specific Gravity of PSH x PSH Thickness)



MONITORING DATA VS. TIME
OW-22
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE
TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:	Measurements in Feet			
		Top of Casing Elevation	Depth to Screen	PSH S.G.	Assumed, LNAPL not measured in area
OW-23		234.60	15.00	0.80	
			65.00		
10/21/97		46.53	47.56	1.03	187.86
11/03/97		46.94	47.55	0.61	187.54
11/24/97		46.45	47.04	0.59	188.03
12/12/97		46.24	46.89	0.65	188.23
12/29/97		46.16	46.84	0.68	188.30
01/12/98		44.90	45.31	0.41	189.62
01/27/98		41.40	41.71	0.31	193.14
02/10/98		40.68	40.91	0.23	193.87
02/24/98		38.22	38.26	0.04	196.38
03/12/98		36.80	36.81	0.01	197.80
03/24/98		34.67	34.68	0.01	199.93
04/13/98		31.56	31.57	0.01	203.04
04/28/98		27.72	28.52	0.80	206.72
05/15/98		ND	24.01	ND	210.59
05/21/98		ND	24.63	ND	209.97
06/08/98		33.53	33.65	0.12	201.05
06/22/98		31.40	31.43	0.03	203.19
07/06/98		29.48	29.64	0.16	205.09
07/23/98		32.63	33.10	0.47	201.88
08/11/98		35.66	36.06	0.40	198.86
08/24/98		37.54	37.94	0.40	196.98
09/08/98		41.02	41.12	0.10	193.56
09/14/98		42.50	42.51	0.01	192.10
09/22/98		ND	39.77	ND	194.83
10/05/98		45.11	45.15	0.04	189.48
10/19/98		44.65	44.79	0.14	189.92
11/13/98		ND	44.32	ND	190.28
11/23/98		44.00	44.02	0.02	190.60
12/07/98		44.98	45.22	0.24	189.57
12/21/98		44.51	44.53	0.02	190.09
01/05/99		45.25	45.45	0.20	189.31
01/18/99		43.93	44.06	0.13	190.64
01/25/99		ND	42.04	ND	192.56
02/08/99		34.83	34.84	0.01	199.77
02/22/99		ND	33.42	ND	201.18
03/08/99		ND	34.81	ND	199.79
03/29/99		33.51	33.52	0.01	201.09
04/13/99		36.46	36.47	0.01	198.14
04/26/99		ND	35.35	ND	199.25
05/10/99		ND	33.54	ND	201.06
05/24/99		34.17	34.18	0.01	200.43
06/07/99		ND	35.39	ND	199.21
06/30/99		37.49	37.50	0.01	197.11
07/11/99		37.63	37.70	0.07	196.96
07/26/99		ND	39.56	ND	195.04
08/09/99		41.35	41.37	0.02	193.25
08/23/99		43.38	43.43	0.05	191.21
09/07/99		45.50	45.63	0.13	189.07
09/27/99		47.84	48.05	0.21	186.72
10/26/99		49.68	50.03	0.35	184.85
11/08/99		50.35	50.40	0.05	184.24
11/22/99		ND	50.10	ND	184.50
12/07/99		50.34	50.38	0.04	184.25

Notes:

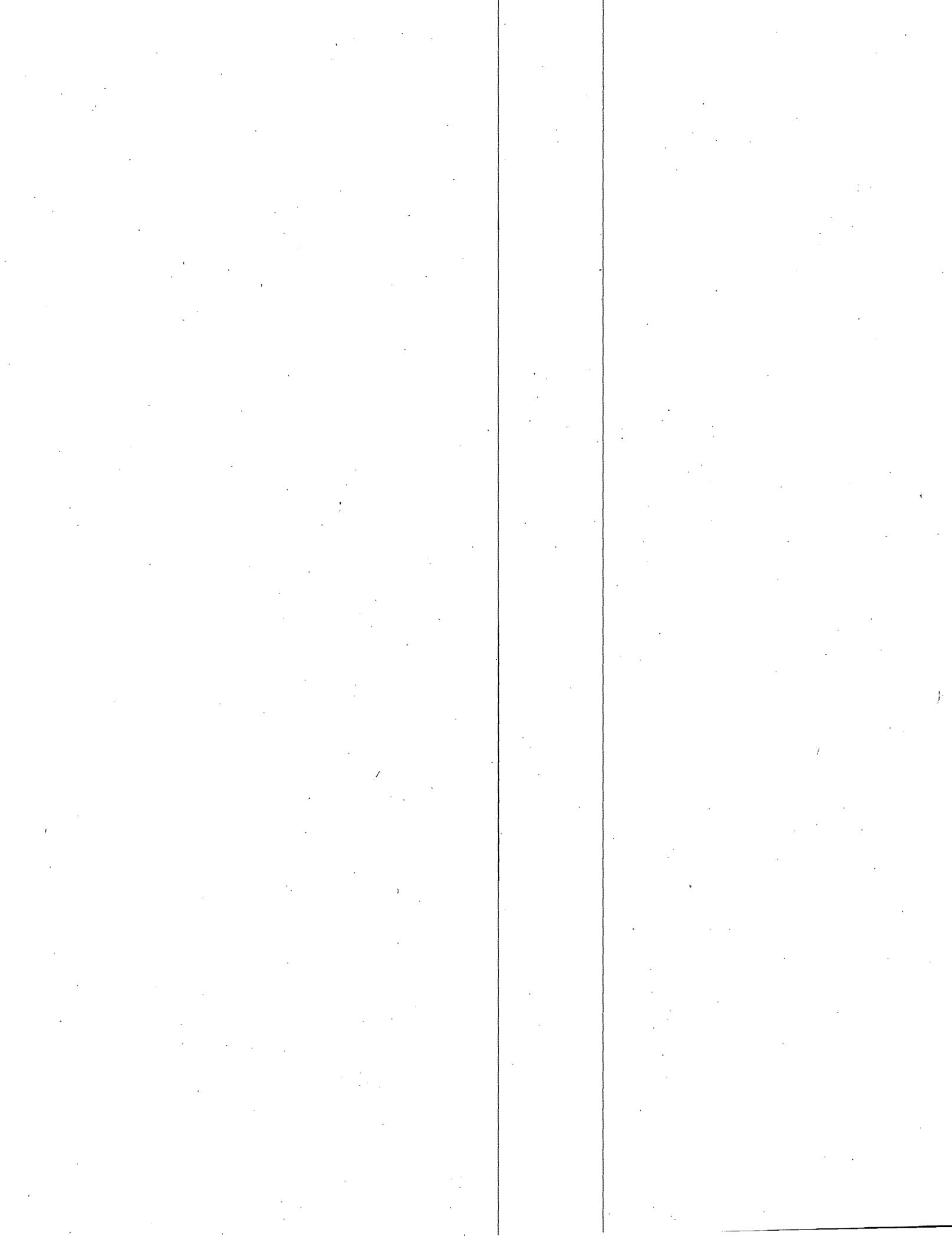
PSH = Phase separated hydrocarbons

ND = Not detected

NG = Not gauged

Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

$$\text{Potentiometric Surface Elevation} = \text{Top of Casing Elevation} - \text{Depth to Water} + (\text{Specific Gravity of PSH} \times \text{PSH Thickness})$$



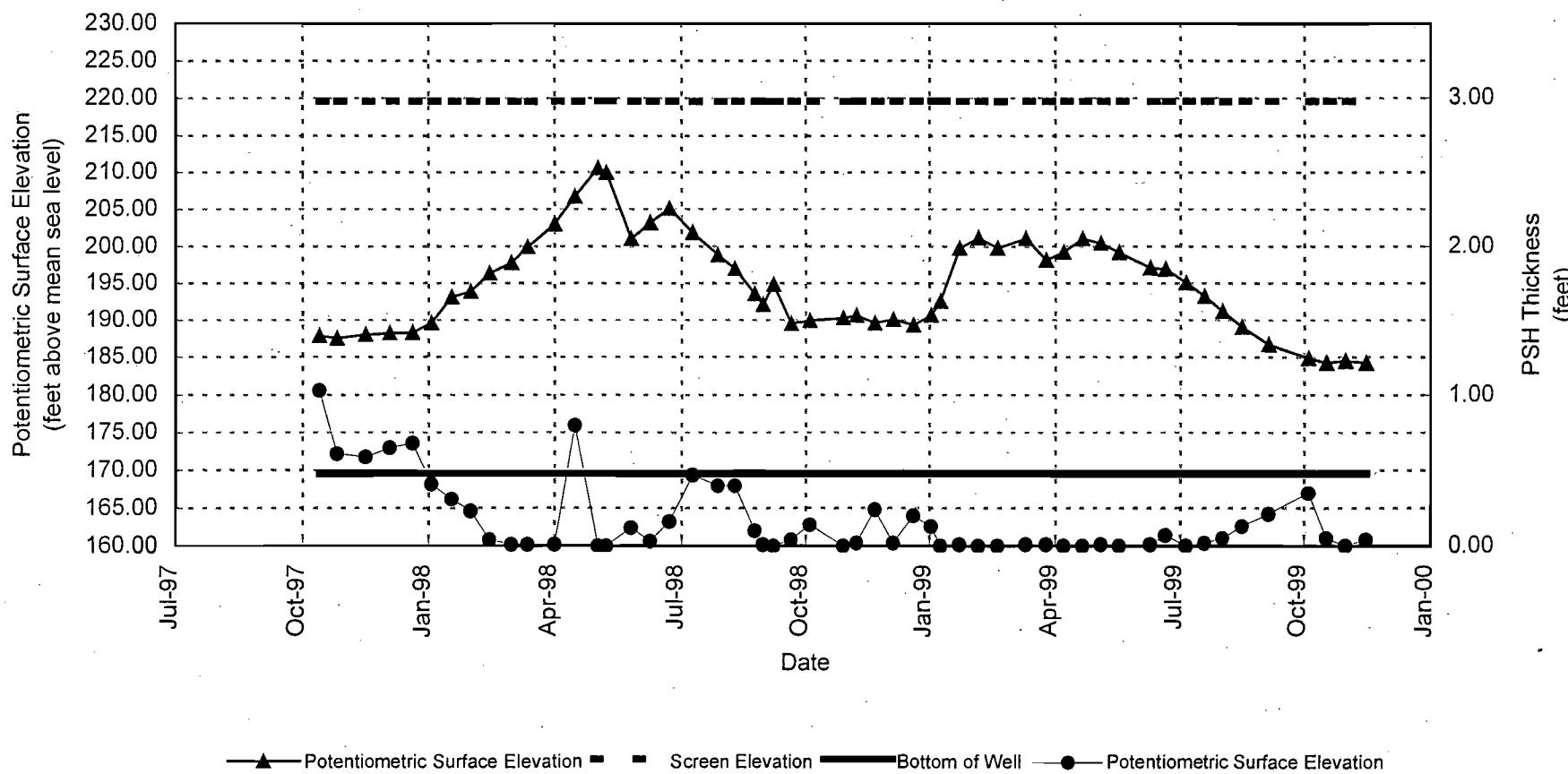
MONITORING DATA VS. TIME

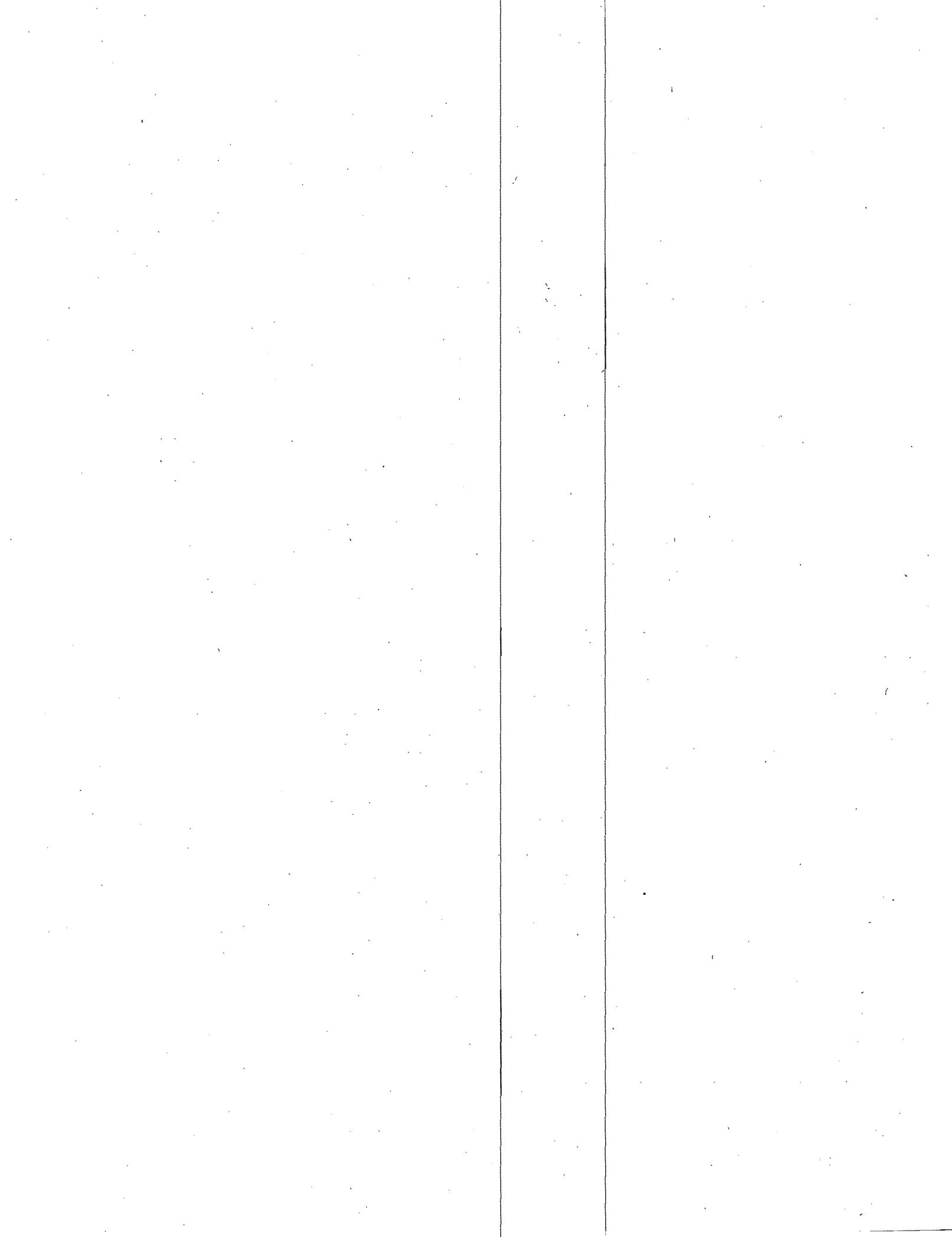
OW-23

WILLIAMS REFINING, L.L.C.

543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE

TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:	Measurements in Feet			
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
OW-24		Top of Casing Elevation Depth to Screen Well Depth	240.19 15.00 65.00	PSH S.G. 0.80	Assumed, LNAPL not measured in area
10/21/97		54.39	54.42	0.03	185.79
11/03/97		54.84	54.87	0.03	185.34
11/24/97		ND	54.37	ND	185.82
12/12/97		ND	54.24	ND	185.95
12/29/97		ND	54.18	ND	186.01
01/12/98		ND	53.42	ND	186.77
01/27/98		ND	49.49	ND	190.70
02/10/98		ND	48.69	ND	191.50
02/24/98		ND	46.80	ND	193.39
03/12/98		ND	44.85	ND	195.34
03/24/98		ND	43.01	ND	197.18
04/13/98		ND	40.25	ND	199.94
04/28/98		ND	36.61	ND	203.58
05/15/98		ND	33.28	ND	206.91
05/21/98		ND	33.80	ND	206.39
06/08/98		41.18	41.48	0.30	198.95
06/22/98		39.70	40.10	0.40	200.41
07/06/98		37.95	38.35	0.40	202.16
07/23/98		40.42	41.10	0.68	199.63
08/11/98		43.50	45.10	1.60	196.37
08/24/98		NG	NG	NG	
09/08/98		48.89	49.05	0.16	191.27
09/14/98		50.25	50.41	0.16	189.91
09/22/98		51.74	51.88	0.14	188.42
10/05/98		53.01	53.10	0.09	187.16
10/19/98		52.58	52.75	0.17	187.58
11/13/98		52.55	52.65	0.10	187.62
11/23/98		51.91	52.01	0.10	188.26
12/07/98		53.02	53.10	0.08	187.15
12/21/98		52.56	52.62	0.06	187.62
01/05/99		53.29	53.38	0.09	186.88
01/18/99		52.28	52.38	0.10	187.89
01/25/99		50.52	50.63	0.11	189.65
02/08/99		45.11	45.26	0.15	195.05
02/22/99		41.58	41.72	0.14	198.58
03/08/99		43.38	43.52	0.14	196.78
03/29/99		41.81	41.95	0.14	198.35
04/13/99		44.60	44.72	0.12	195.57
04/26/99		43.72	43.88	0.16	196.44
05/10/99		41.97	42.13	0.16	198.19
05/24/99		42.17	42.32	0.15	197.99
06/07/99		43.31	43.53	0.22	196.84
06/30/99		45.57	45.78	0.21	194.58
07/11/99		45.80	46.02	0.22	194.35
07/26/99		47.50	47.75	0.25	192.64
08/09/99		49.32	49.60	0.28	190.81
08/23/99		51.30	51.60	0.30	188.83
09/07/99		53.48	53.78	0.30	186.65
09/27/99		56.20	56.35	0.15	183.96
10/26/99		ND	58.33	ND	181.86
11/08/99		ND	58.95	ND	181.24
11/22/99		DRY	DRY		
12/07/99		ND	59.68	ND	180.51

Notes:

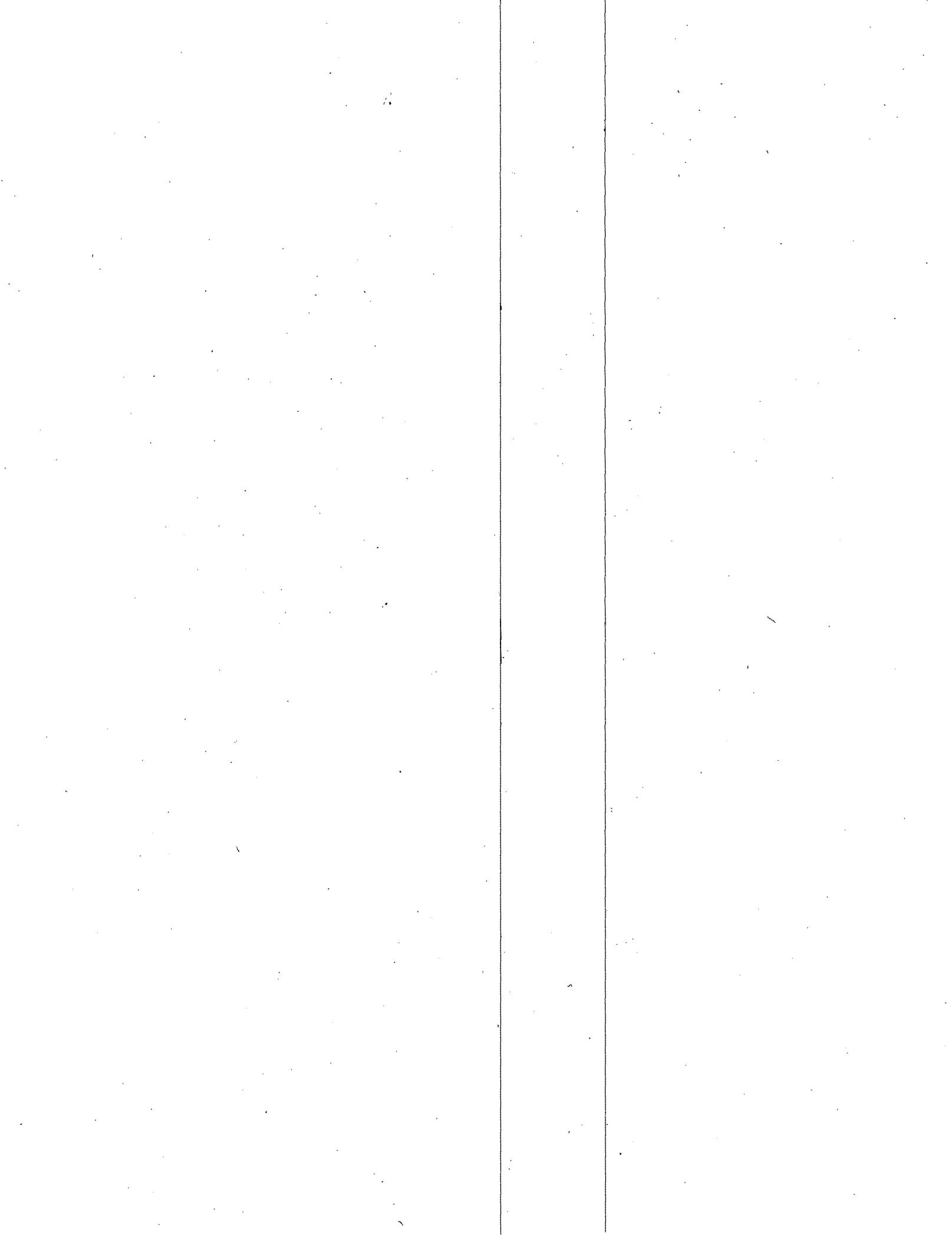
PSH = Phase separated hydrocarbons

ND = Not detected

NG = Not gauged

Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

Potentiometric Surface Elevation = Top of Casing Elevation - Depth to Water + (Specific Gravity of PSH x PSH Thickness)



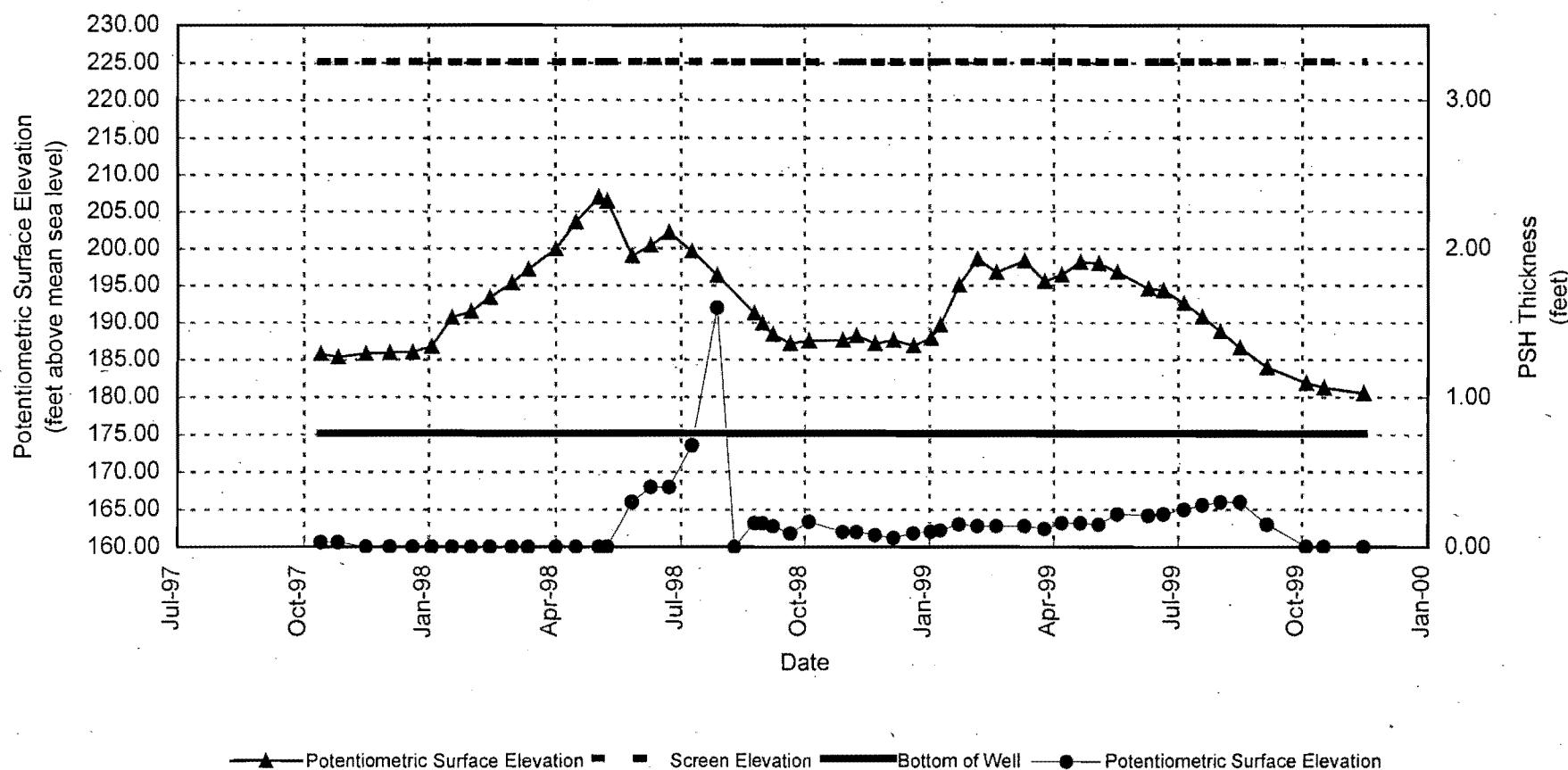
MONITORING DATA VS. TIME

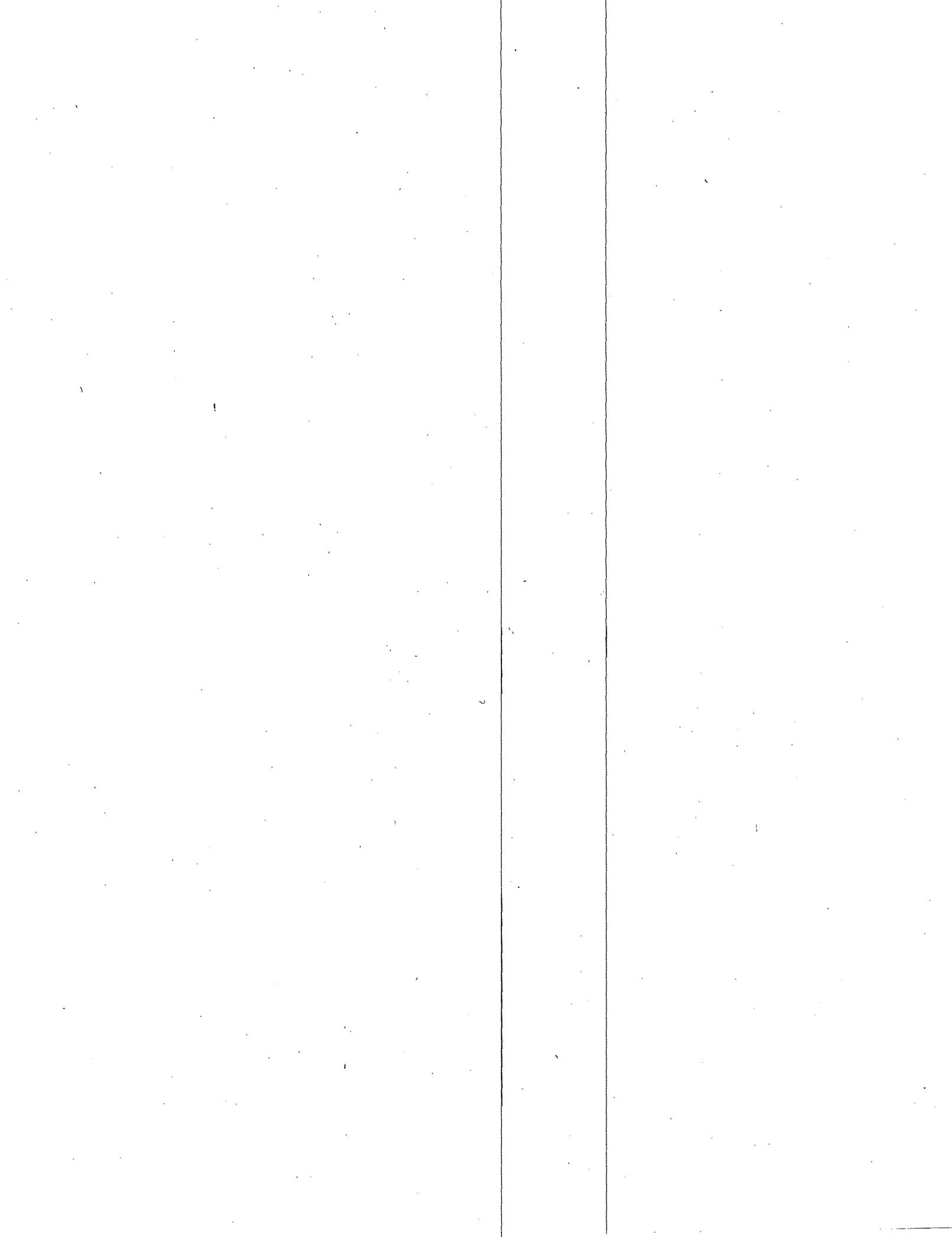
OW-24

WILLIAMS REFINING, L.L.C.

543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE

TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:	Measurements in Feet			
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
OW-26		Top of Casing Elevation Depth to Screen Well Depth	217.48 10.00 60.00	PSH S.G. 0.80	Assumed, LNAPL not measured in area
10/21/97		ND	11.77	ND	205.71
11/03/97		ND	11.82	ND	205.66
11/24/97		ND	12.19	ND	205.29
12/12/97		ND	12.37	ND	205.11
12/29/97		ND	11.75	ND	205.73
01/12/98		ND	10.93	ND	206.55
01/27/98		ND	9.22	ND	208.26
02/10/98		ND	10.33	ND	207.15
02/24/98		ND	8.92	ND	208.56
03/12/98		ND	8.63	ND	208.85
03/24/98		ND	8.72	ND	208.76
04/13/98		ND	7.69	ND	209.79
04/28/98		ND	6.26	ND	211.22
05/15/98		NG	NG	NG	
05/21/98		NG	NG	NG	
06/08/98		ND	8.03	ND	209.45
06/22/98		ND	7.77	ND	209.71
07/06/98		ND	8.81	ND	208.67
07/23/98		NG	NG	NG	
08/11/98		ND	8.10	ND	209.38
08/24/98		ND	9.35	ND	208.13
09/08/98		ND	10.94	ND	206.54
09/14/98		ND	11.51	ND	205.97
09/22/98		ND	12.05	ND	205.43
10/05/98		ND	12.59	ND	204.89
10/19/98		ND	12.48	ND	205.00
11/13/98		NG	NG	NG	
11/23/98		ND	12.92	ND	204.56
12/07/98		ND	13.10	ND	204.38
12/21/98		ND	12.20	ND	205.28
01/05/99		ND	12.14	ND	205.34
01/18/99		ND	11.75	ND	205.73
01/25/99		ND	10.48	ND	207.00
02/08/99		ND	7.92	ND	209.56
02/22/99		ND	8.65	ND	208.83
03/08/99		ND	9.66	ND	207.62
03/29/99		ND	7.67	ND	209.81
04/13/99		ND	9.22	ND	208.26
04/26/99		ND	8.80	ND	208.68
05/10/99		ND	8.07	ND	209.41
05/24/99		ND	9.20	ND	208.28
06/07/99		ND	12.16	ND	205.32
06/30/99		ND	10.82	ND	206.66
07/11/99		ND	11.10	ND	206.38
07/26/99		ND	12.14	ND	205.34
08/09/99		ND	13.03	ND	204.45
08/23/99		ND	13.60	ND	203.88
09/07/99		ND	14.26	ND	203.22
09/27/99		ND	14.97	ND	202.51
10/26/99		ND	15.54	ND	201.94
11/08/99		ND	15.80	ND	201.68
11/22/99		ND	15.42	ND	202.06
12/07/99		ND	15.44	ND	202.04

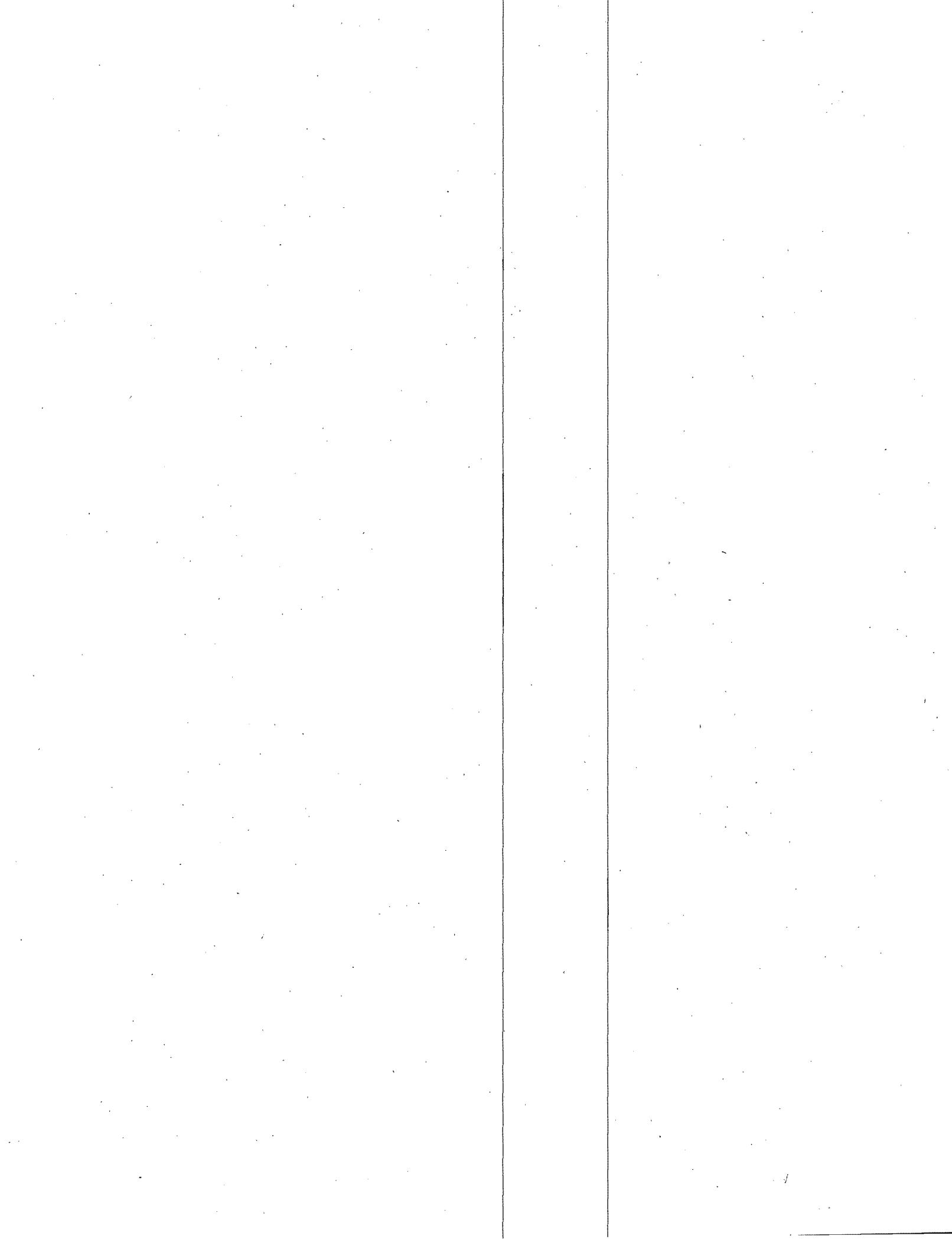
Notes:

PSH = Phase separated hydrocarbons

ND = Not detected NG = Not gauged

Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

$$\text{Potentiometric Surface Elevation} = \text{Top of Casing Elevation} - \text{Depth to Water} + (\text{Specific Gravity of PSH} \times \text{PSH Thickness})$$



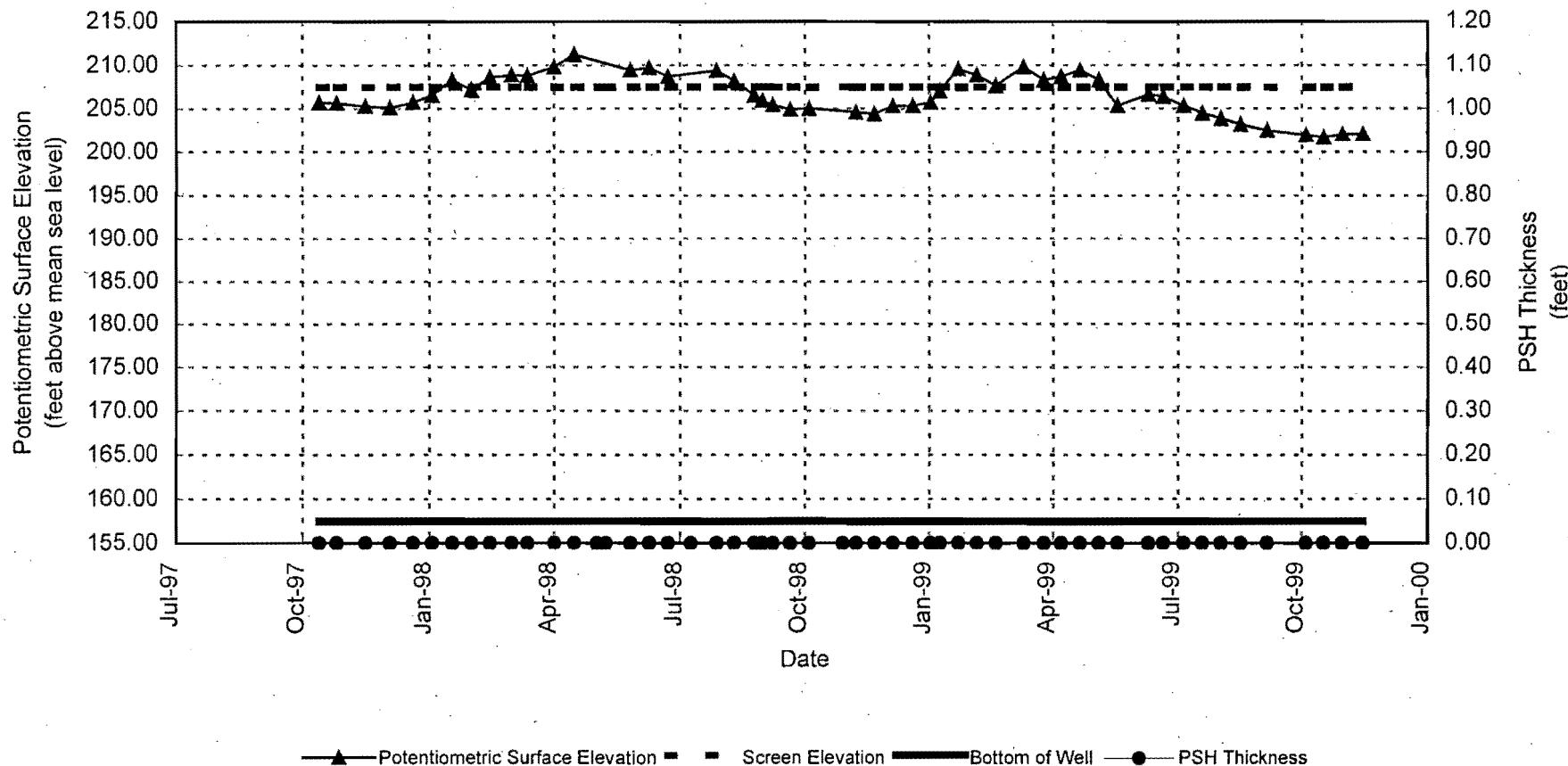
MONITORING DATA VS. TIME

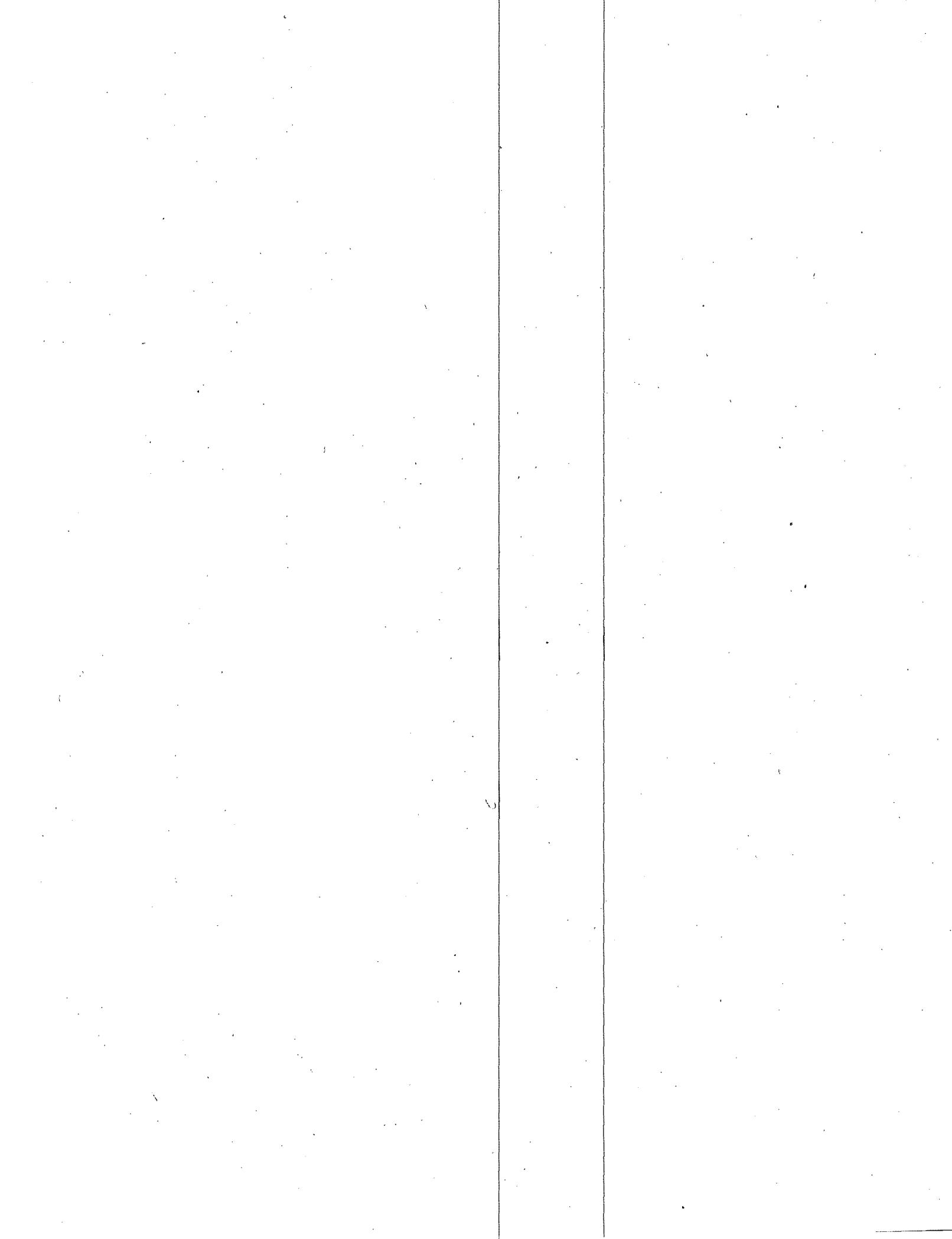
OW-26

WILLIAMS REFINING, L.L.C.

543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE

TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:	Measurements in Feet			
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
OW-27		Top of Casing Elevation 13.00 Well Depth 63.00	218.64	0.7420	Measured (10/99)
10/21/97		8.94	28.98	20.04	204.53
11/03/97		9.40	28.35	18.95	204.35
11/24/97		9.96	28.06	18.10	204.01
12/12/97		10.38	27.61	17.23	203.81
12/29/97		9.75	27.60	17.85	204.28
01/12/98		8.60	27.60	19.00	205.14
01/27/98		6.03	27.22	21.19	207.14
02/10/98		7.50	27.22	19.72	206.05
02/24/98		5.40	27.13	21.73	207.63
03/12/98		5.07	26.96	21.89	207.92
03/24/98		3.62	26.88	23.26	209.02
04/13/98		3.57	26.85	23.28	209.06
04/28/98		2.41	24.81	22.40	210.45
05/15/98		1.88	24.71	22.83	210.87
05/21/98		2.02	25.41	23.39	210.59
06/08/98		3.96	27.08	23.12	208.72
06/22/98		3.55	26.34	22.79	209.21
07/06/98		3.90	26.51	22.61	208.91
07/23/98		4.37	28.27	23.90	208.10
08/11/98		4.00	27.25	23.25	208.64
08/24/98		5.45	27.39	21.94	207.53
09/08/98		7.90	27.85	19.95	205.59
09/14/98		8.68	28.07	19.39	204.96
09/22/98		9.35	28.23	18.88	204.42
10/05/98		10.05	28.07	18.02	203.94
10/19/98		9.85	28.15	18.30	204.07
11/13/98		10.22	27.62	17.40	203.93
11/23/98		10.39	27.62	17.23	203.80
12/07/98		11.05	27.67	16.62	203.30
12/21/98		9.57	28.00	18.43	204.32
01/05/99		9.63	27.93	18.30	204.29
01/18/99		9.23	27.93	18.70	204.59
01/25/99		7.37	27.60	20.23	206.05
02/08/99		3.98	26.83	22.85	208.76
02/22/99		4.97	26.99	22.02	207.99
03/08/99		6.35	27.68	21.33	206.79
03/29/99		4.83	27.25	22.42	208.03
04/13/99		5.59	27.68	22.09	207.35
04/26/99		4.72	27.56	22.84	208.03
05/10/99		3.90	27.30	23.40	208.70
05/24/99		5.46	27.40	21.94	207.52
06/07/99		6.60	27.55	20.95	206.63
06/30/99		7.60	27.55	19.95	205.89
07/11/99		7.83	27.70	19.87	205.68
07/26/99		9.42	27.79	18.37	204.48
08/09/99		10.58	27.97	17.39	203.57
08/23/99		11.54	28.11	16.57	202.82
09/07/99		12.38	28.12	15.74	202.20
09/27/99		14.47	27.93	13.46	200.70
10/26/99		14.42	28.02	13.60	200.71
11/08/99		14.68	27.93	13.25	200.54
11/22/99		14.38	27.65	13.27	200.84
12/07/99		14.35	27.70	13.35	200.85

Notes:

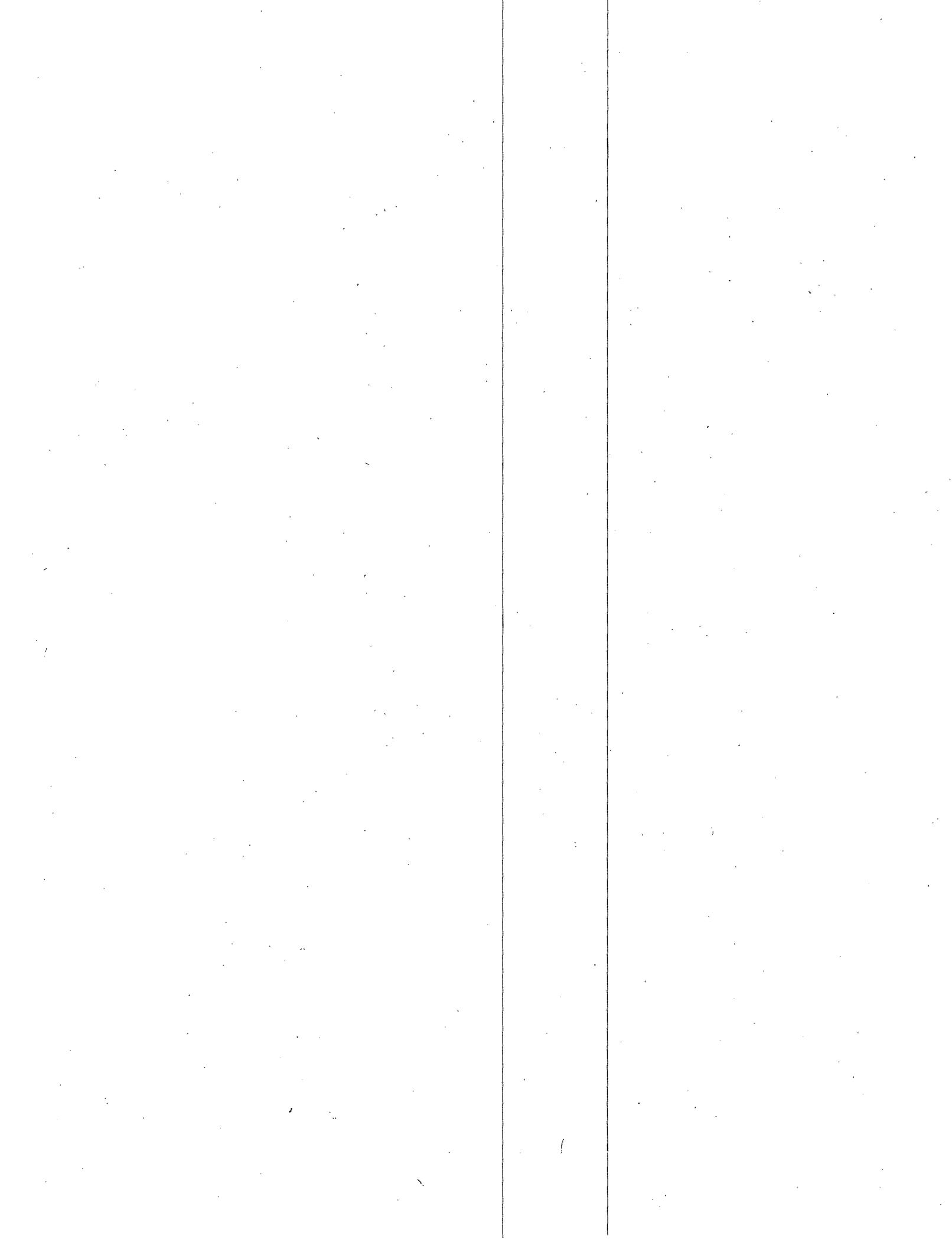
PSH = Phase separated hydrocarbons

ND = Not detected

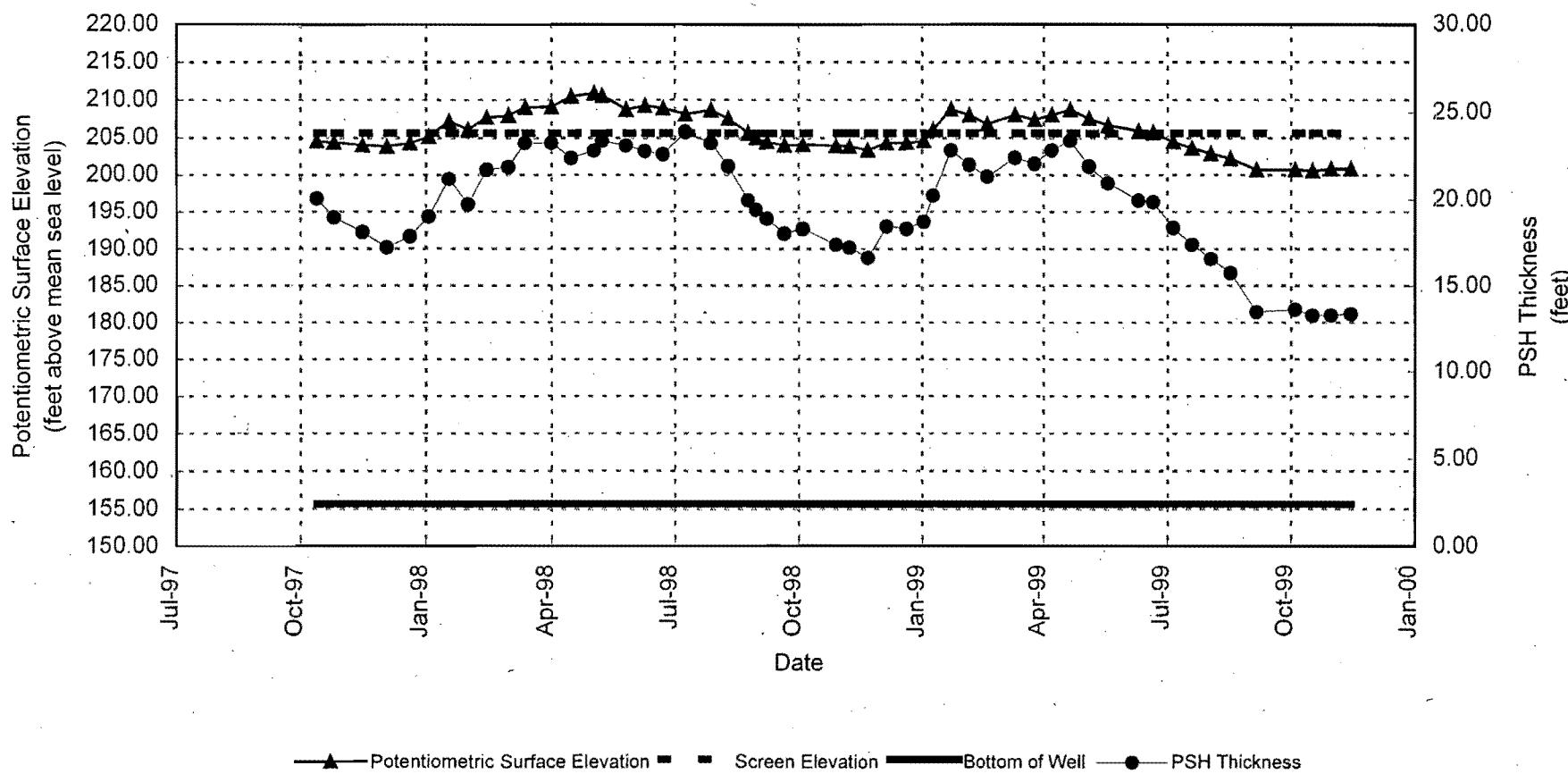
NG = Not gauged

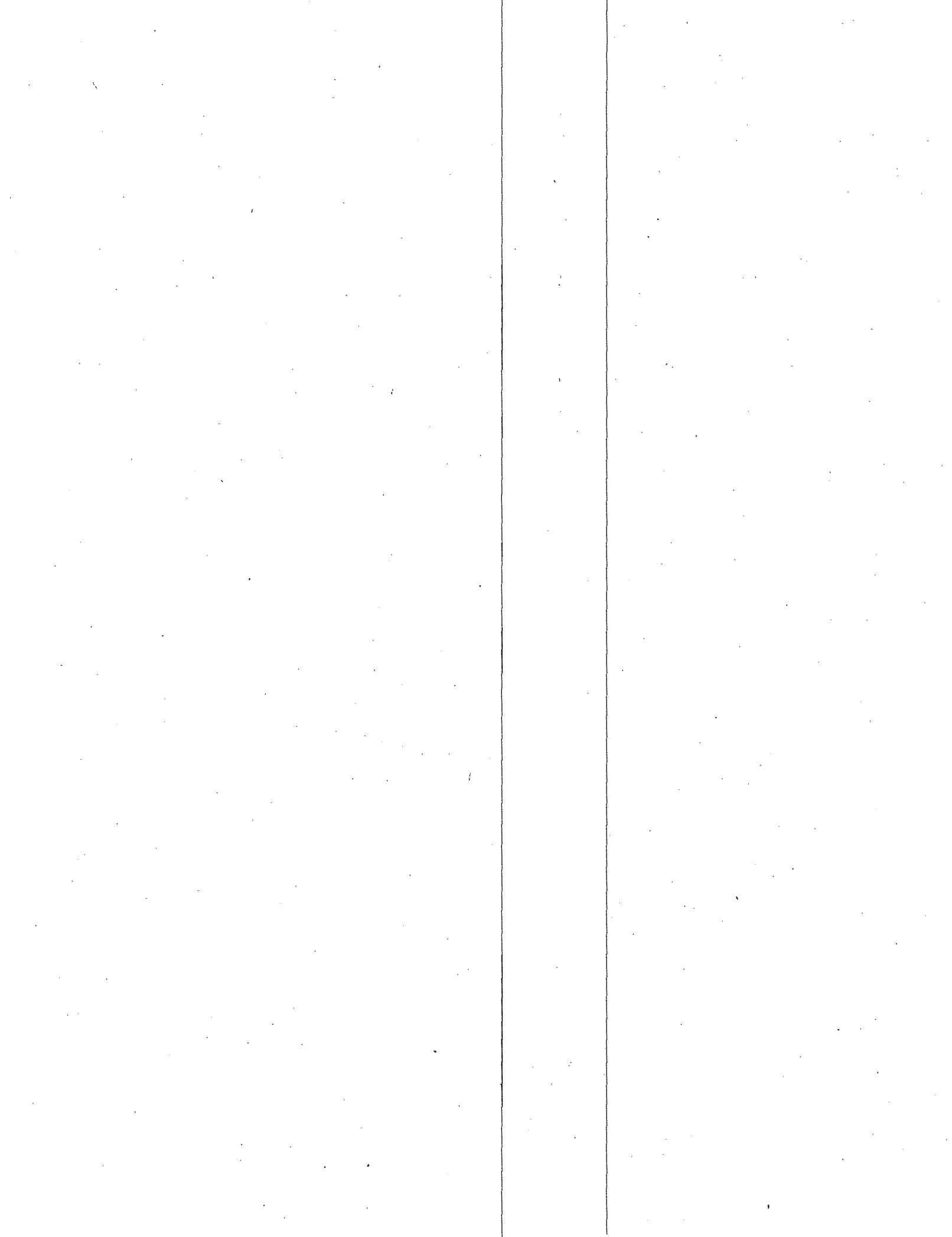
Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

$$\text{Potentiometric Surface Elevation} = \text{Top of Casing Elevation} - \text{Depth to Water} + (\text{Specific Gravity of PSH} \times \text{PSH Thickness})$$



MONITORING DATA VS. TIME
OW-27
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE
TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:	Measurements in Feet			
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
OW-36		Top of Casing Elevation Depth to Screen Well Depth	218.70 23.00 73.00	PSH S.G. 0.7999	Measured (10/99)
10/21/97		ND	15.48	ND	203.22
11/03/97		15.62	15.70	0.08	203.06
11/24/97		16.02	16.10	0.08	202.66
12/12/97		NG	NG	NG	
12/29/97		15.35	15.85	0.50	203.25
01/12/98		13.91	14.39	0.48	204.69
01/27/98		11.42	11.92	0.50	207.18
02/10/98		8.34	8.36	0.02	210.36
02/24/98		10.70	11.18	0.48	207.90
03/12/98		10.83	11.33	0.50	207.77
03/24/98		9.09	9.59	0.50	209.51
04/13/98		9.46	9.56	0.10	209.22
04/28/98		7.41	7.51	0.10	211.27
05/15/98		NG	NG	NG	
05/21/98		NG	NG	NG	
06/08/98		10.51	10.90	0.39	208.11
06/22/98		9.07	9.52	0.45	209.54
07/06/98		9.06	9.36	0.30	209.58
07/23/98		NG	NG	NG	
08/11/98		10.71	11.16	0.45	207.90
08/24/98		NG	NG	NG	
09/08/98		14.46	14.99	0.53	204.13
09/14/98		15.13	15.68	0.55	203.46
09/22/98		15.69	16.25	0.56	202.90
10/05/98		16.23	16.71	0.48	202.37
10/19/98		15.87	16.27	0.40	202.75
11/13/98		13.36	13.70	0.34	205.27
11/23/98		15.80	16.35	0.55	202.79
12/07/98		16.45	17.01	0.56	202.14
12/21/98		15.03	15.61	0.58	203.55
01/05/99		15.16	15.71	0.55	203.43
01/18/99		14.42	15.02	0.60	204.16
01/25/99		12.12	12.72	0.60	206.46
02/08/99		8.53	8.92	0.39	210.09
02/22/99		9.83	10.25	0.42	208.79
03/08/99		11.28	11.71	0.43	207.33
03/29/99		9.85	10.31	0.46	208.76
04/13/99		11.00	11.50	0.50	207.60
04/26/99		9.72	10.22	0.50	208.88
05/10/99		8.82	9.30	0.48	209.78
05/24/99		10.75	11.25	0.50	207.85
06/07/99		11.79	12.33	0.54	206.80
06/30/99		8.15	8.93	0.78	210.39
07/11/99		12.88	13.48	0.60	205.70
07/26/99		15.02	15.62	0.60	203.56
08/09/99		15.88	16.50	0.62	202.70
08/23/99		16.83	17.43	0.60	201.75
09/07/99		17.59	18.24	0.65	200.98
09/27/99		18.40	19.00	0.60	200.18
10/26/99		19.18	19.35	0.17	199.49
11/08/99		19.57	19.77	0.20	199.09
11/22/99		19.22	19.50	0.28	199.42
12/07/99		19.15	19.73	0.58	199.43

Notes:

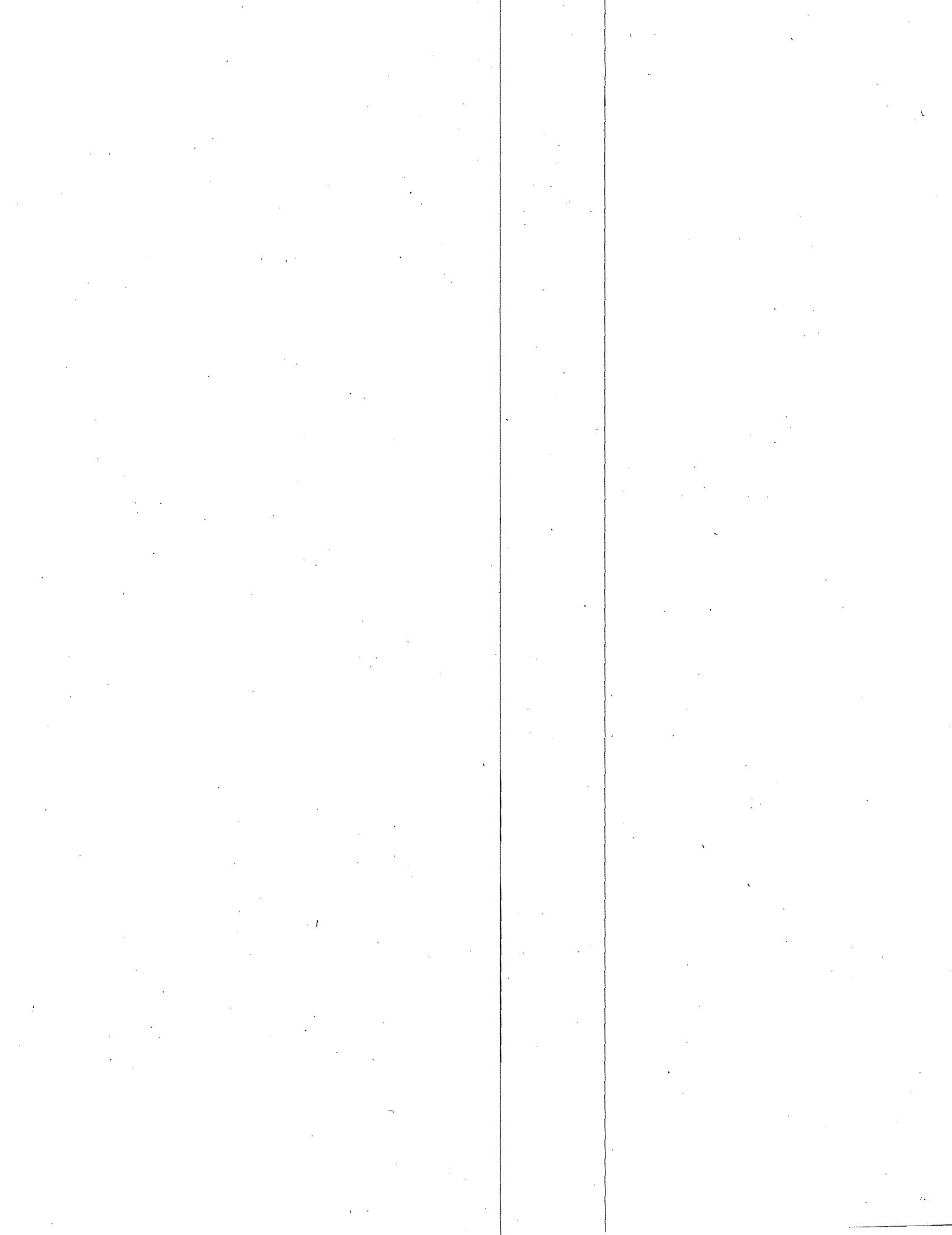
PSH = Phase separated hydrocarbons

ND = Not detected

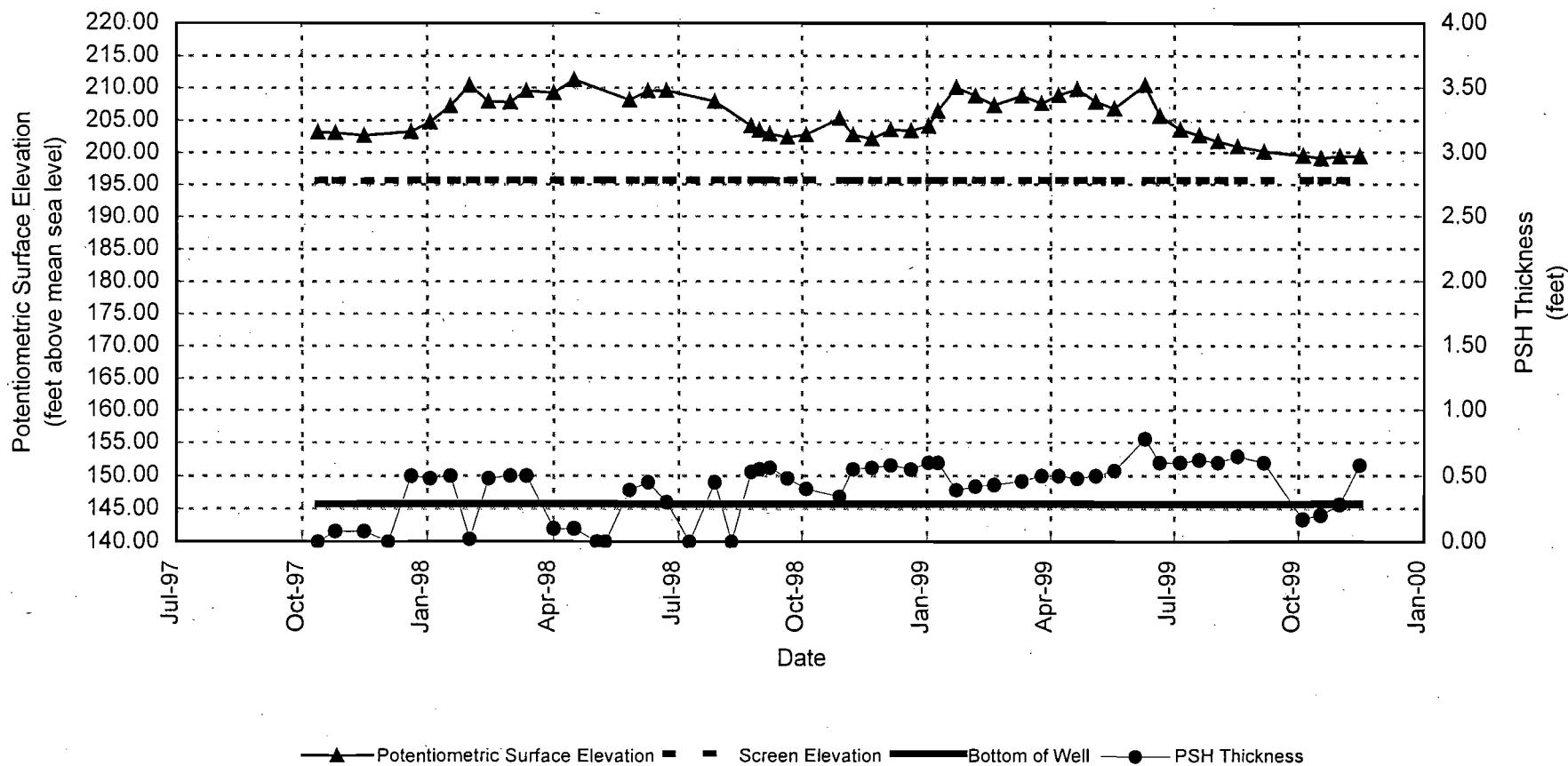
NG = Not gauged

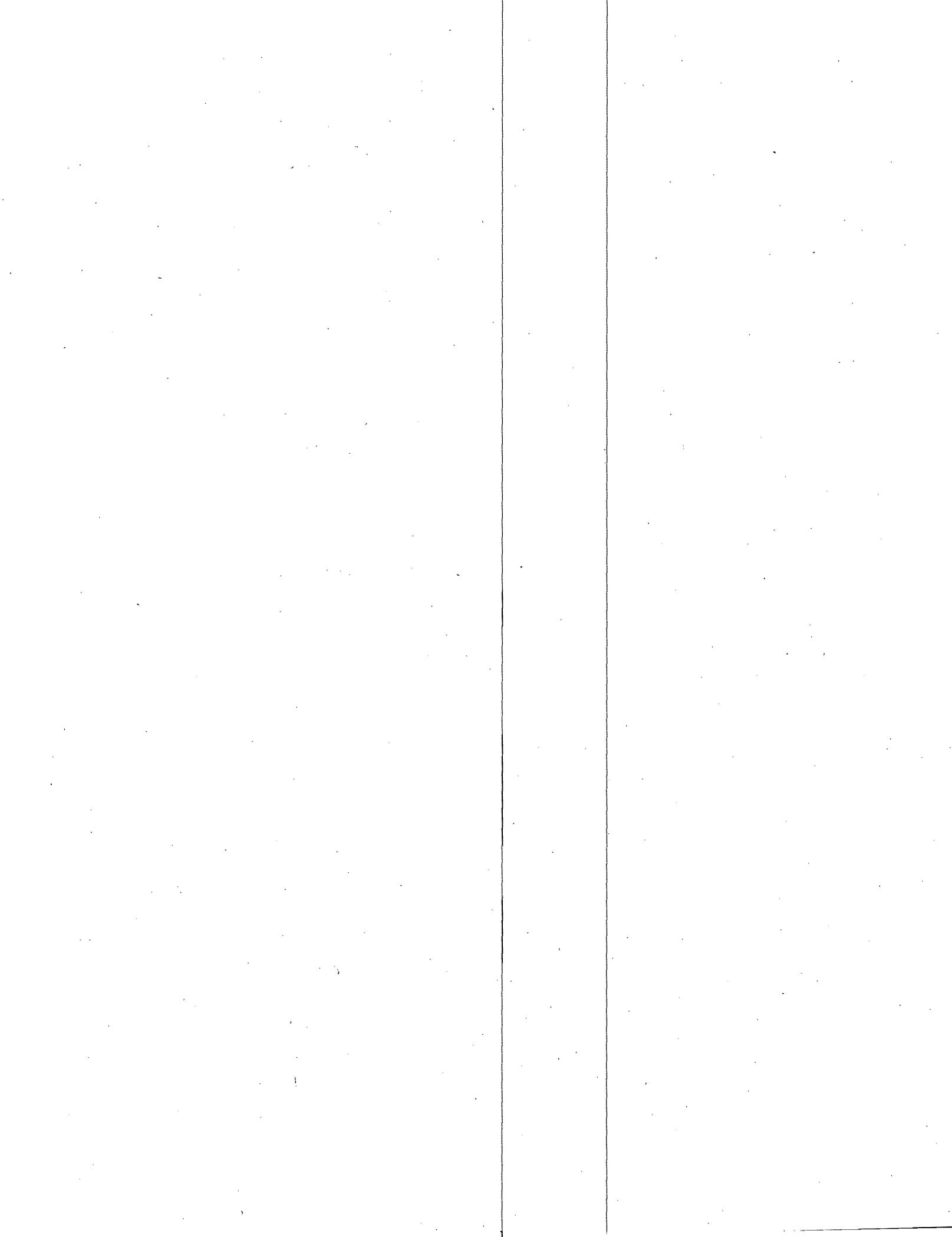
Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

$$\text{Potentiometric Surface Elevation} = \text{Top of Casing Elevation} - \text{Depth to Water} + (\text{Specific Gravity of PSH} \times \text{PSH Thickness})$$



MONITORING DATA VS. TIME
OW-36
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE
TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:	Measurements in Feet			
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
OW-39		232.81	20.00	0.8713	Measured (10/99)
		70.00			
10/21/97		36.33	40.33	4.00	195.97
11/03/97		37.22	38.42	1.20	195.44
11/24/97		37.05	38.73	1.68	195.54
12/12/97		36.93	38.63	1.70	195.66
12/29/97		36.40	37.53	1.13	196.26
01/12/98		35.97	37.89	1.92	196.59
01/27/98		33.30	34.00	0.70	199.42
02/10/98		33.83	33.92	0.09	198.97
02/24/98		32.12	33.11	0.99	200.56
03/12/98		31.17	32.80	1.63	201.43
03/24/98		29.43	31.63	2.20	203.10
04/13/98		27.42	28.50	1.08	205.25
04/28/98		ND	24.92	ND	207.89
05/15/98		22.54	23.54	1.00	210.14
05/21/98		22.48	23.08	0.60	210.25
06/08/98		24.90	41.80	16.90	205.73
06/22/98		25.43	35.23	9.80	206.12
07/06/98		25.28	27.15	1.87	207.29
07/23/98		24.95	35.80	10.85	206.46
08/11/98		26.65	41.20	14.55	204.29
08/24/98		28.13	45.61	17.48	202.43
09/08/98		30.54	45.00	14.46	200.41
09/14/98		31.68	44.32	12.64	199.50
09/22/98		33.21	44.50	11.29	198.15
10/05/98		35.32	36.42	1.10	197.35
10/19/98		35.60	37.45	1.85	196.97
11/13/98		36.09	37.08	0.99	196.59
11/23/98		35.90	36.33	0.43	196.85
12/07/98		36.41	37.10	0.69	196.31
12/21/98		36.18	36.40	0.22	196.60
01/05/99		36.18	37.40	1.22	196.47
01/18/99		35.33	36.20	0.87	197.37
01/25/99		33.99	34.30	0.31	198.78
02/08/99		30.07	31.72	1.65	202.53
02/22/99		27.95	28.60	0.65	204.78
03/08/99		27.75	33.27	5.52	204.35
03/29/99		26.81	29.08	2.27	205.71
04/13/99		27.38	41.90	14.52	203.56
04/26/99		27.50	33.22	5.72	204.57
05/10/99		27.05	31.02	3.97	205.25
05/24/99		26.57	35.19	8.62	205.13
06/07/99		27.72	35.52	7.80	204.09
06/30/99		28.35	37.18	8.83	203.32
07/11/99		29.12	36.52	7.40	202.74
07/26/99		30.62	36.92	6.30	201.38
08/09/99		32.15	37.72	5.57	199.94
08/23/99		34.03	36.25	2.22	198.49
09/07/99		35.82	37.05	1.23	196.83
09/27/99		37.92	38.50	0.58	194.82
10/26/99		39.45	40.15	0.70	193.27
11/08/99		39.87	40.80	0.93	192.82
11/22/99		40.52	40.94	0.42	192.24
12/07/99		40.90	41.62	0.72	191.82

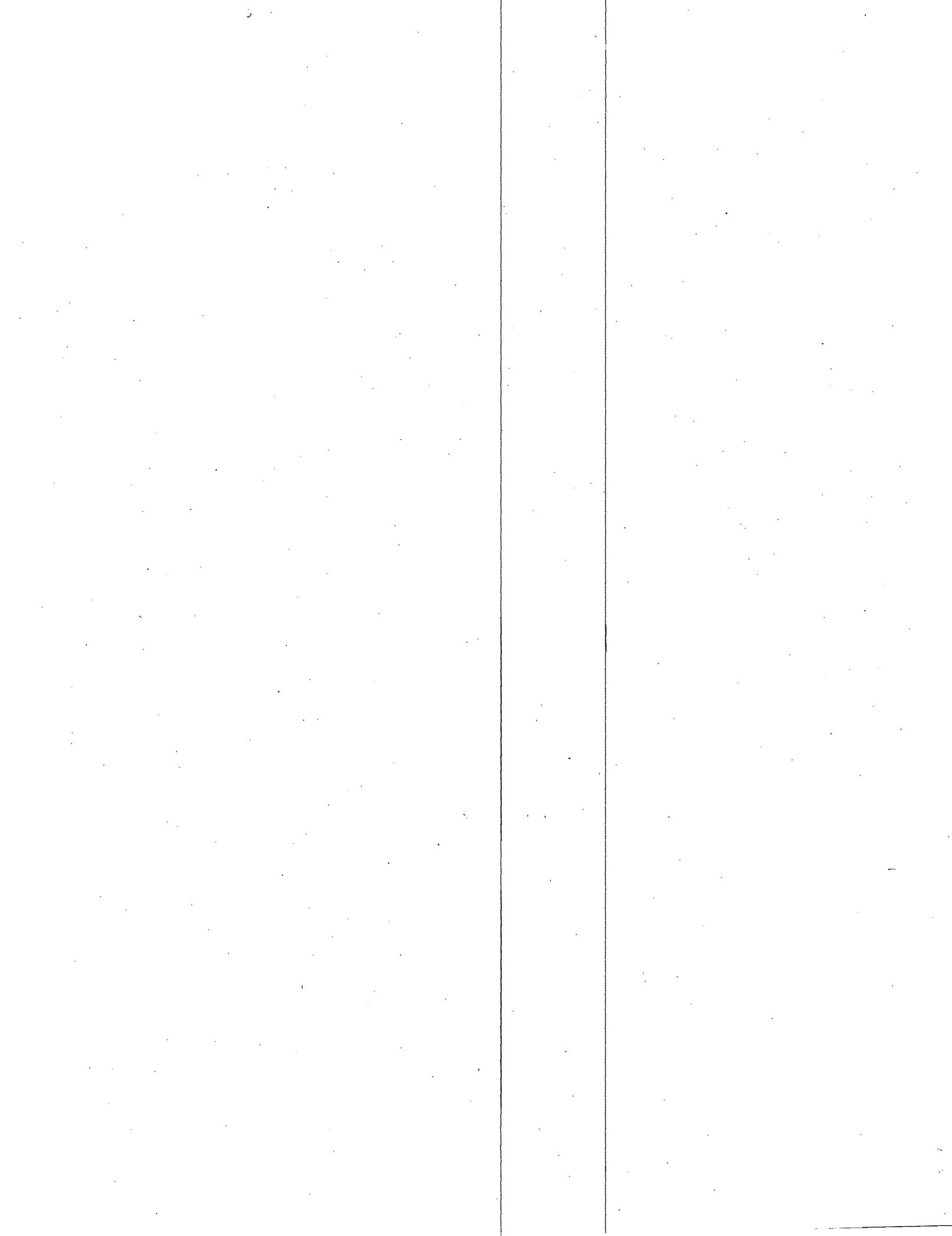
Notes:

PSH = Phase separated-hydrocarbons

ND = Not detected NG = Not gauged

Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

$$\text{Potentiometric Surface Elevation} = \text{Top of Casing Elevation} - \text{Depth to Water} + (\text{Specific Gravity of PSH} \times \text{PSH Thickness})$$



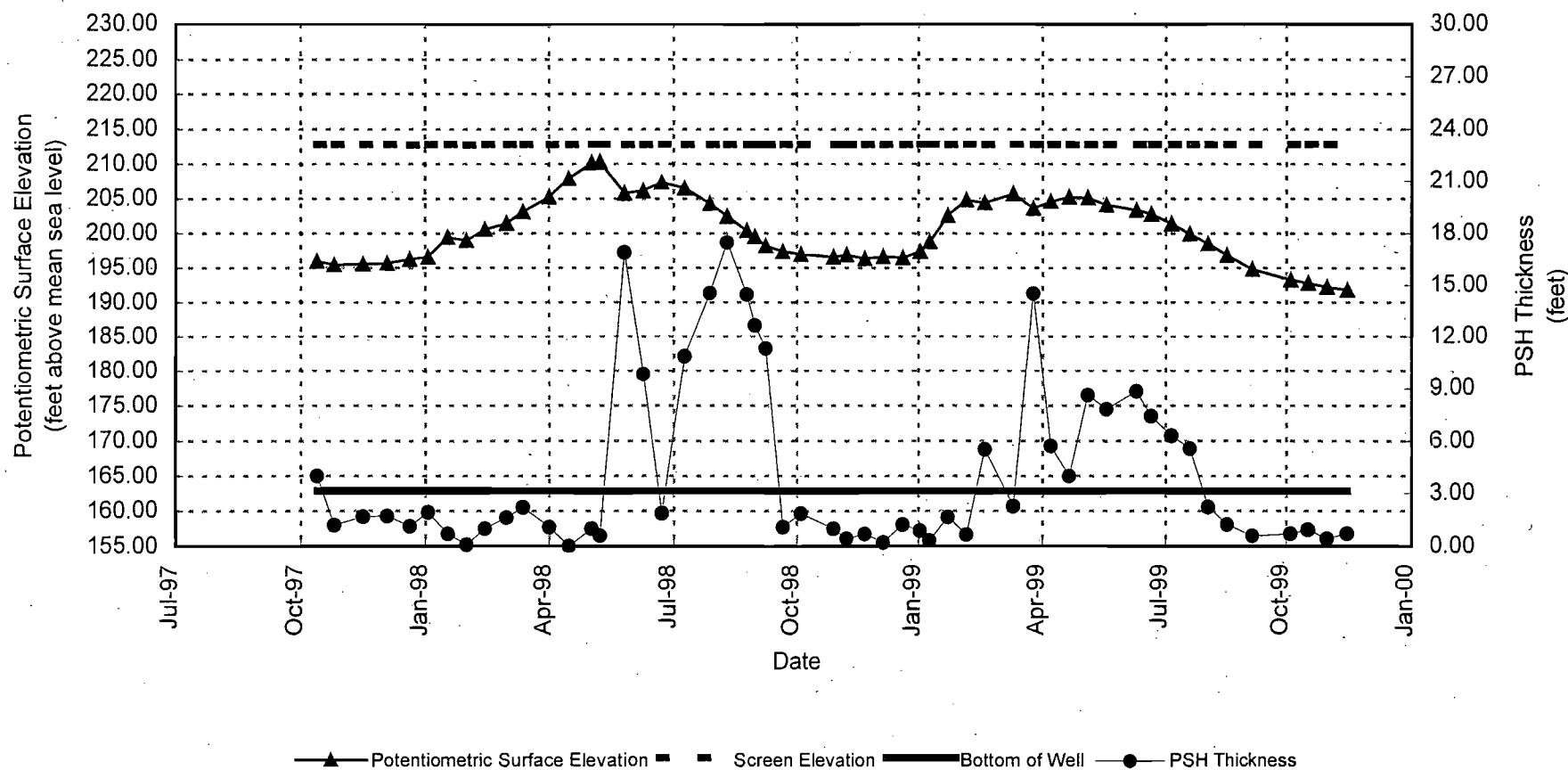
MONITORING DATA VS. TIME

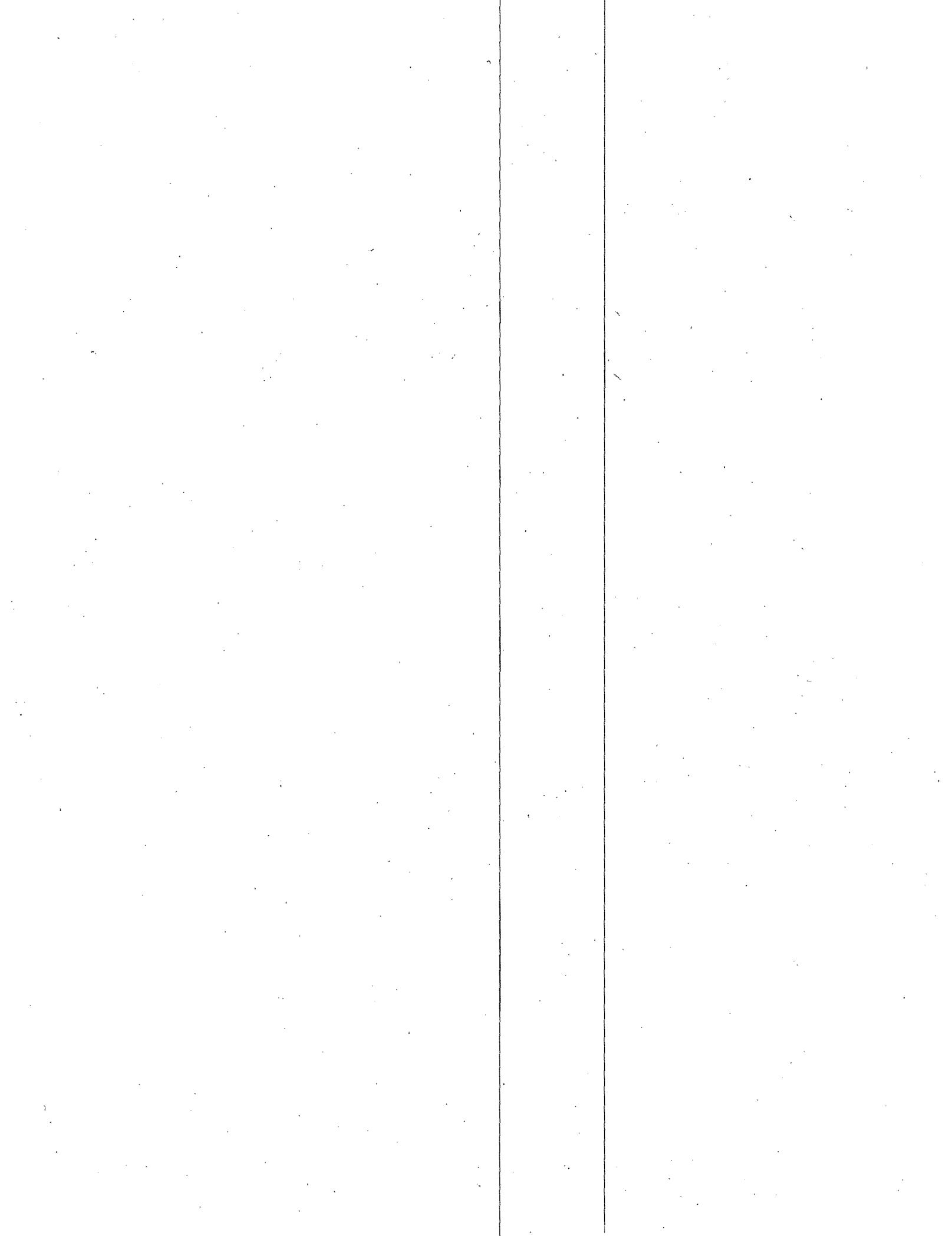
OW-39

WILLIAMS REFINING, L.L.C.

543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE

TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:	Top of Casing Elevation Depth to Screen Well Depth	226.50 27.00 73.00	PSH S.G. 0.8468	Assumed, based on S.G. of LNAPL measured in OW-16 (10/99)
Monitoring Date	Notes	Measurements in Feet			
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
10/20/97		29.60	32.18	2.58	196.50
11/03/97		29.77	31.76	1.99	196.43
11/25/97		29.87	31.86	1.99	196.33
12/12/97		29.97	31.94	1.97	196.23
12/29/97		29.39	31.35	1.96	196.81
01/12/98		29.03	30.95	1.92	197.18
01/27/98		26.12	26.30	0.18	200.35
02/10/98		35.47	35.63	0.16	191.01
02/24/98		31.08	32.20	1.12	195.25
03/12/98		29.62	32.08	2.46	196.50
03/25/98		28.52	31.55	3.03	197.52
04/13/98		28.13	29.85	1.72	198.11
04/28/98		ND	23.87	ND	202.63
05/15/98		22.82	28.00	5.18	202.89
05/22/98		23.90	28.46	4.56	201.90
06/08/98		29.78	30.82	1.04	196.56
06/22/98		28.15	29.33	1.18	198.17
07/06/98		27.24	28.78	1.54	199.02
07/23/98		21.11	21.87	0.76	205.27
08/11/98		22.47	23.41	0.94	203.89
08/24/98		NG	NG	NG	
09/08/98		ND	33.37	ND	193.13
09/14/98		34.73	35.15	0.42	191.71
09/22/98		36.02	36.58	0.56	190.39
10/05/98		37.20	37.65	0.45	189.23
10/19/98		36.32	36.77	0.45	190.11
11/13/98		36.69	37.16	0.47	189.74
11/23/98		36.04	36.52	0.48	190.39
12/07/98		37.76	38.10	0.34	188.69
12/21/98		29.45	29.63	0.18	197.02
01/05/99		32.50	32.85	0.35	193.95
01/18/99		30.54	30.98	0.44	195.89
01/25/99		28.33	28.84	0.51	198.09
02/08/99		22.26	22.64	0.38	204.18
02/22/99		21.07	27.75	6.68	204.41
03/08/99		24.95	25.70	0.75	201.44
03/29/99		22.90	27.85	4.95	202.84
04/13/99		NG	NG	NG	
04/26/99		ND	26.57	ND	199.93
05/10/99		ND	16.60	ND	209.90
05/24/99		30.45	30.78	0.33	196.00
06/07/99		32.00	32.15	0.15	194.48
06/30/99		32.56	32.64	0.08	193.93
07/11/99		31.95	32.32	0.37	194.49
07/26/99		34.75	35.13	0.38	191.69
08/09/99		27.80	28.05	0.25	198.66
08/23/99		37.68	38.07	0.39	188.76
09/07/99		39.47	39.84	0.37	186.97
09/27/99		40.78	40.82	0.04	185.71

Notes:

PSH = Phase separated hydrocarbons

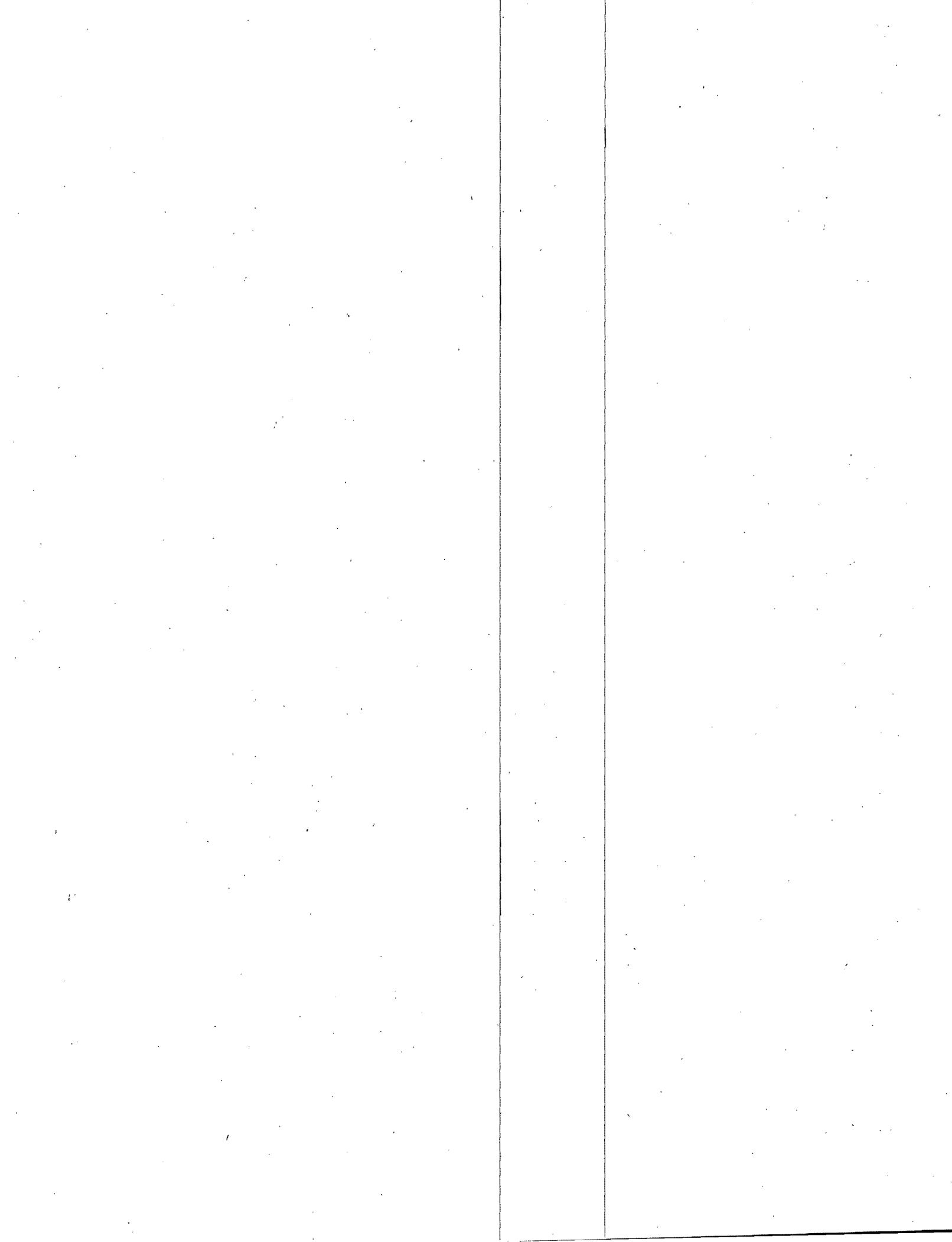
ND = Not detected

NG = Not gauged

NS = Not sampled

Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

$$\text{Potentiometric Surface Elevation} = \text{Top of Casing Elevation} - \text{Depth to Water} + (\text{Specific Gravity of PSH} \times \text{PSH Thickness})$$



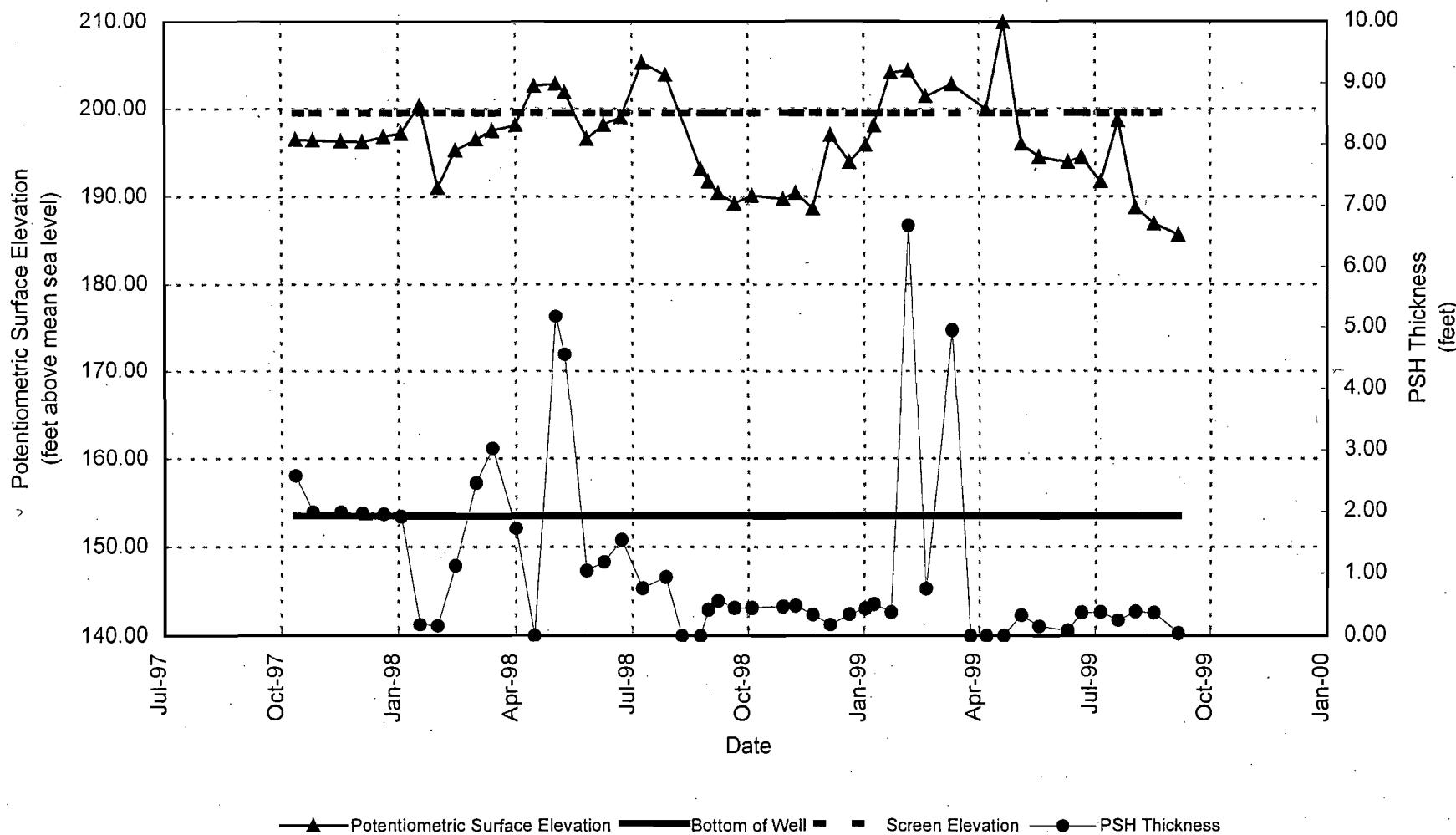
MONITORING DATA VS. TIME

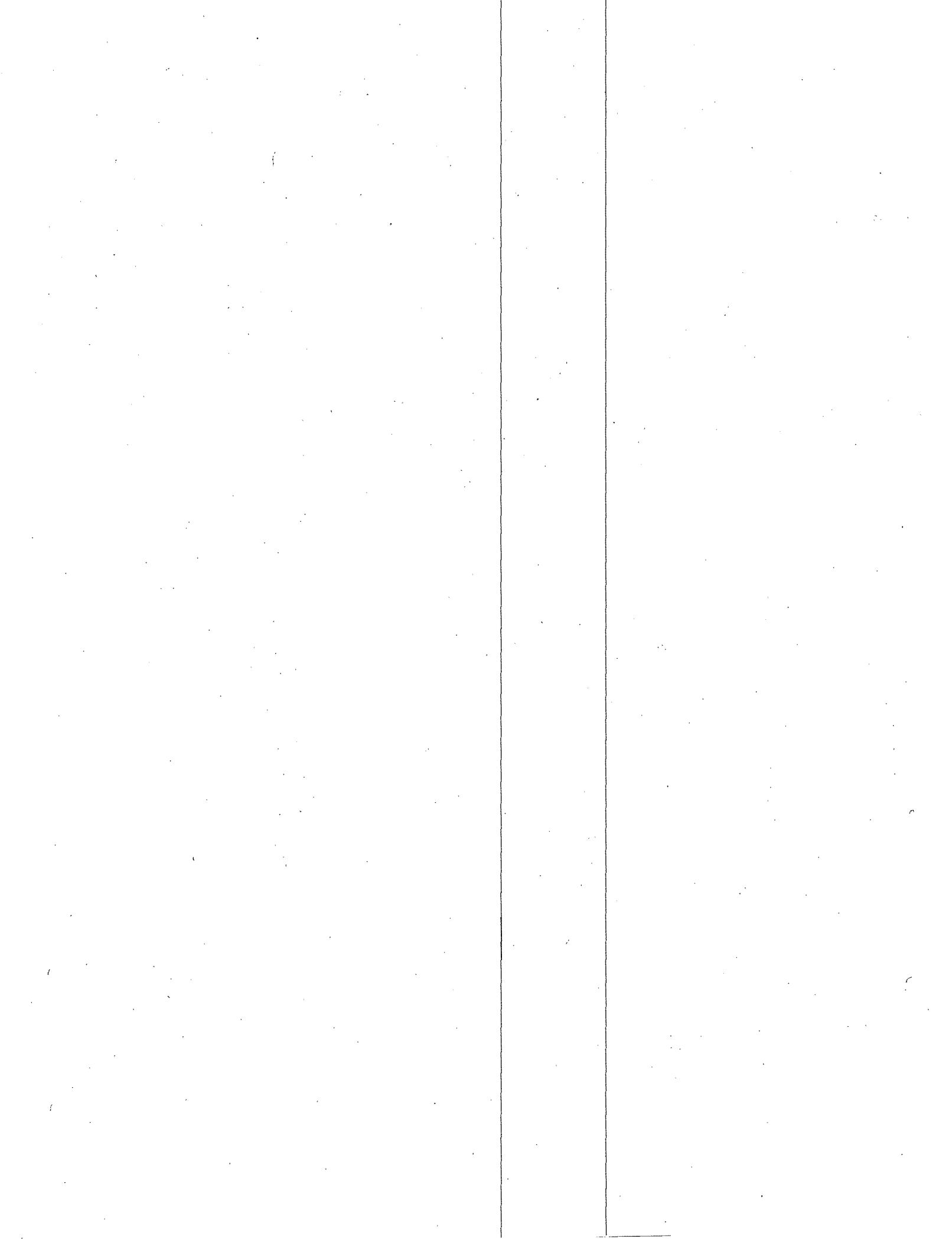
RW-1

WILLIAMS REFINING, L.L.C.

543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE

TDEC ID NO. 9-791214

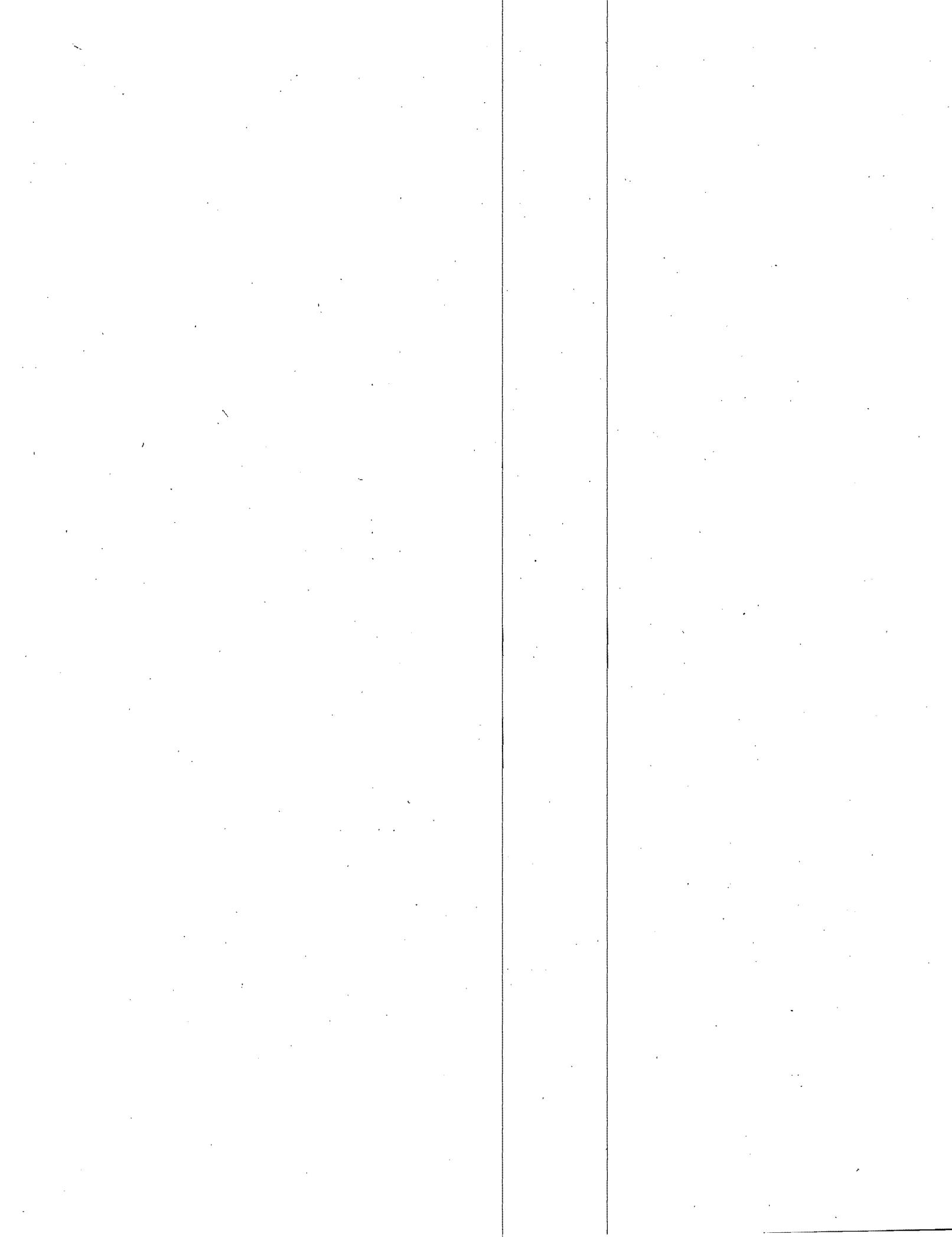




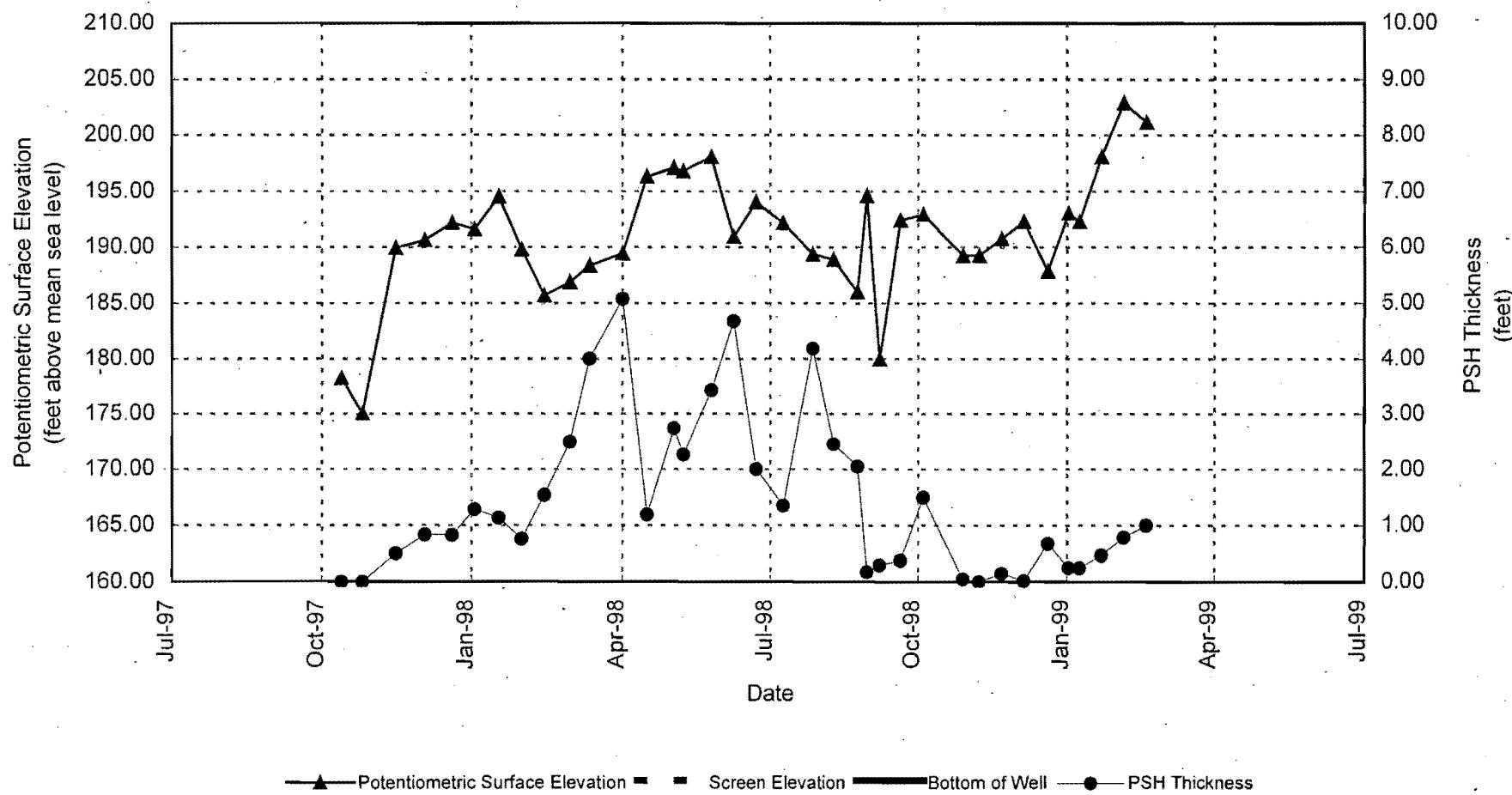
APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

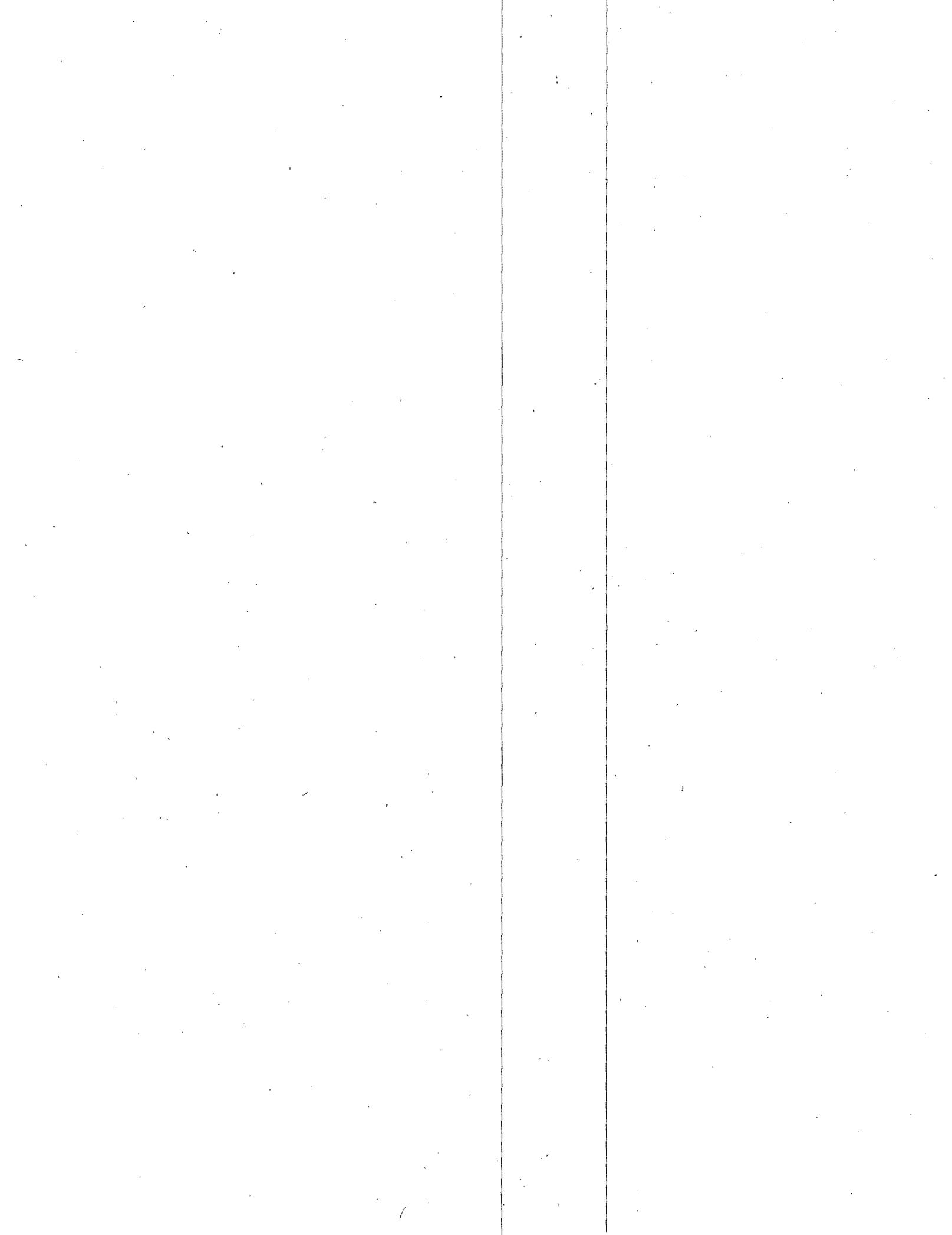
Well:	Construction:	Top of Casing Elevation Depth to Screen Well Depth	232.29 not available not available	PSH S.G. 0.8008	Assumed, based on S.G. of LNAPL measured in RW-3(R) (10/99)
Monitoring Date	Notes	Measurements in Feet			
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
10/21/97		ND	54.05	ND	178.24
11/03/97		ND	57.25	ND	175.04
11/24/97		42.25	42.75	0.50	189.94
12/12/97		41.50	42.34	0.84	190.62
12/29/97		39.94	40.77	0.83	192.18
01/12/98		40.45	41.73	1.28	191.59
01/27/98		37.54	38.67	1.13	194.52
02/10/98		42.36	43.12	0.76	189.78
02/24/98		46.30	47.84	1.54	185.68
03/12/98		44.91	47.40	2.49	186.88
03/24/98		43.15	47.15	4.00	188.34
04/13/98		41.83	46.91	5.08	189.45
04/28/98		35.73	36.92	1.19	196.32
05/15/98		34.64	37.38	2.74	197.10
05/21/98		35.04	37.30	2.26	196.80
06/08/98		33.55	36.98	3.43	198.06
06/22/98		40.42	45.10	4.68	190.94
07/06/98		37.85	39.85	2.00	194.04
07/23/98		39.85	41.20	1.35	192.17
08/11/98		42.10	46.28	4.18	189.36
08/24/98		42.90	45.35	2.45	188.90
09/08/98		45.87	47.92	2.05	186.01
09/14/98		37.64	37.82	0.18	194.61
09/22/98		52.30	52.60	0.30	179.93
10/05/98		39.80	40.18	0.38	192.41
10/19/98		39.05	40.55	1.50	192.94
11/13/98		43.05	43.10	0.05	189.23
11/23/98		ND	43.05	ND	189.24
12/07/98		41.50	41.65	0.15	190.76
12/21/98		40.00	40.02	0.02	192.29
01/05/99		44.30	44.98	0.68	187.85
01/18/99		39.18	39.43	0.25	193.06
01/25/99		39.95	40.20	0.25	192.29
02/08/99		34.13	34.60	0.47	198.07
02/22/99		29.26	30.05	0.79	202.87
03/08/99		30.95	31.95	1.00	201.14
03/29/99		WELL CLOSED AND ABANDONED			

Notes:
 PSH = Phase separated hydrocarbons
 ND = Not detected NG = Not gauged
 Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:
 Potentiometric Surface Elevation = Top of Casing Elevation - Depth to Water + (Specific Gravity of PSH x PSH Thickness)
 O:\WILLIAMSREFINERY\DATA\RWT-1.XLS



MONITORING DATA VS. TIME
RW-3
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE
TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:	Measurements in Feet			
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
RW-3(R)		Top of Casing Elevation Depth to Screen Well Depth	227.13 27.00 67.00	PSH S.G. 0.8008	Measured 10/99
10/21/97					
11/03/97					
11/24/97					
12/12/97					
12/29/97					
01/12/98					
01/27/98					
02/10/98					
02/24/98					
03/12/98					
03/24/98					
04/13/98					
04/28/98					
05/15/98					
05/21/98					
06/08/98					
06/22/98					
07/06/98					
07/23/98					
08/11/98					
08/24/98					
09/08/98					
09/14/98					
09/22/98					
10/05/98					
10/19/98					
11/13/98					
11/23/98					
12/07/98					
12/21/98					
01/05/99					
01/18/99					
01/25/99					
02/08/99					
02/22/99					
03/08/99					
03/29/99		ND	30.85	ND	196.28
04/13/99		32.70	32.78	0.08	194.41
04/26/99		ND	50.11	ND	177.02
05/10/99		31.35	31.42	0.07	195.77
05/24/99		30.95	31.12	0.17	196.15
06/07/99		ND	51.90	ND	175.23
06/30/99		33.59	33.87	0.28	193.48
07/11/99		33.55	34.18	0.63	193.45
07/26/99		38.88	39.65	0.77	188.10
08/09/99		ND	44.41	ND	182.72
08/23/99		38.62	38.97	0.35	188.44
09/07/99		40.60	41.58	0.98	186.33
09/27/99		42.71	43.51	0.80	184.26

Notes:

PSH = Phase separated hydrocarbons

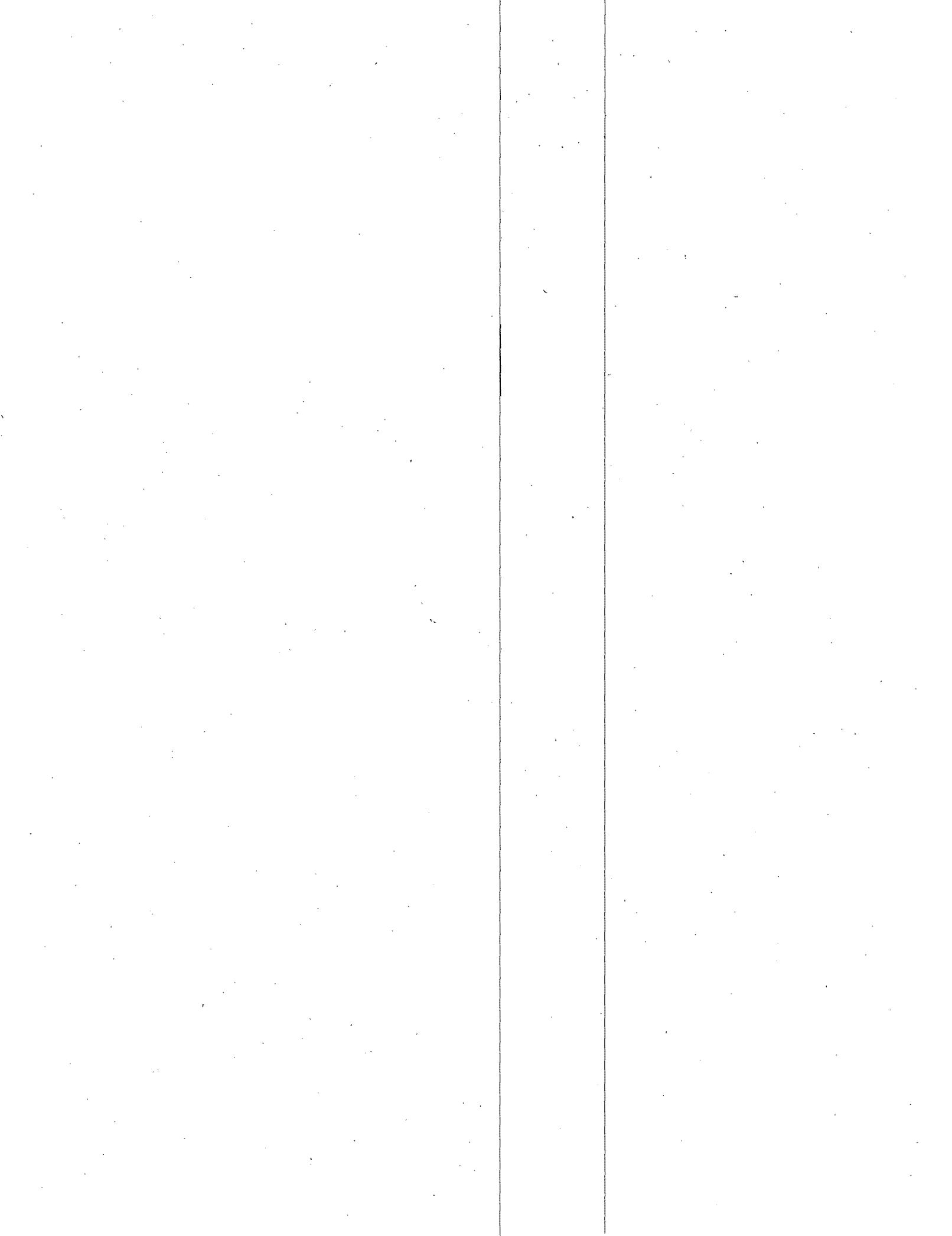
ND = Not detected

NG = Not gauged

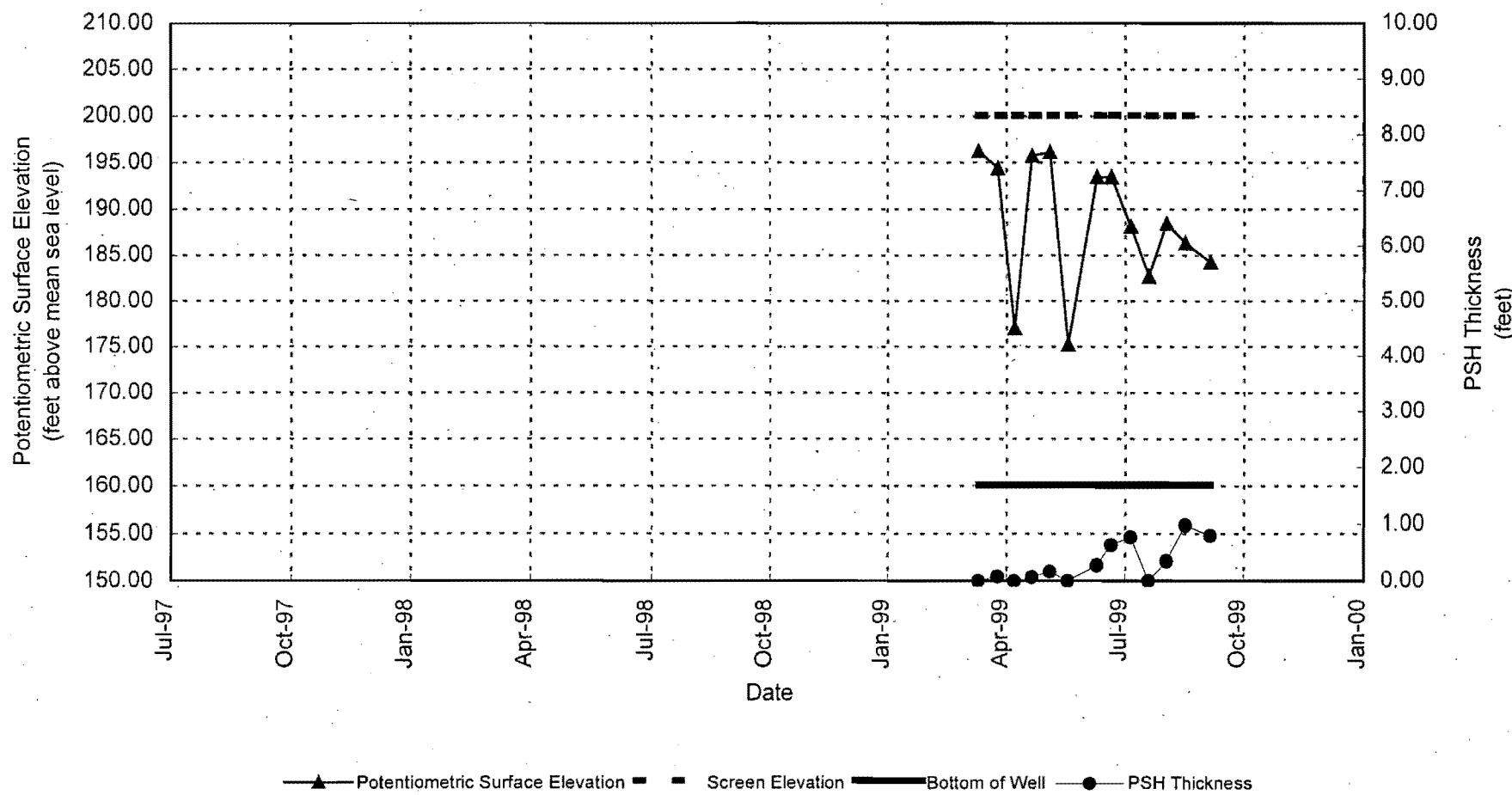
Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

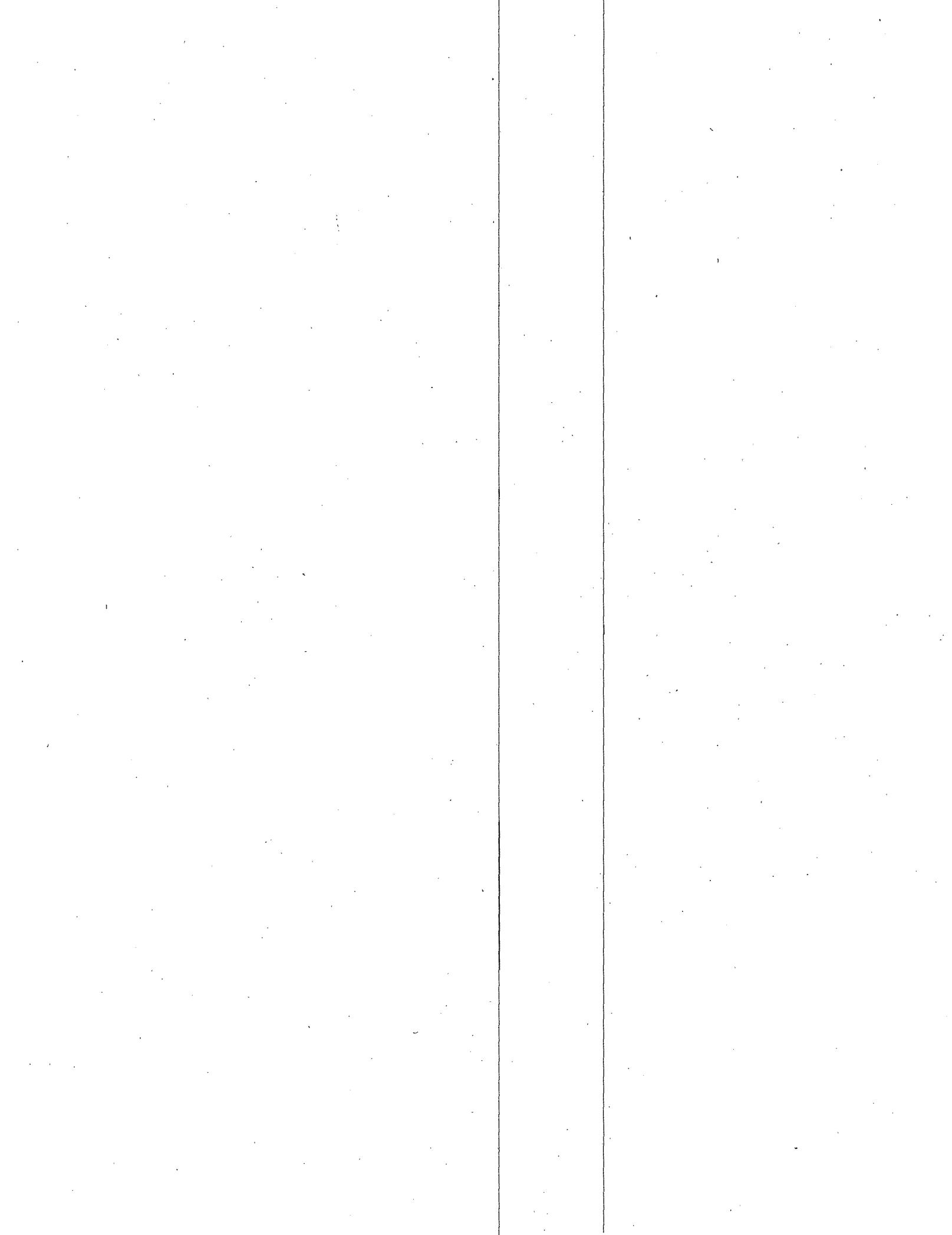
$$\text{Potentiometric Surface Elevation} = \text{Top of Casing Elevation} - \text{Depth to Water} + (\text{Specific Gravity of PSH} \times \text{PSH Thickness})$$

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MONITORING DATA VS. TIME
RW-3(R)
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE
TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:	Top of Casing Elevation	219.69	PSH S.G.	0.7788	Assumed, based on S.G. of LNAPL measured in B-1 (10/99)
		Depth to Screen	not available			
		Well Depth	not available			
Measurements in Feet						
Monitoring Date	Notes	Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation	
10/21/97		29.99	30.71	0.72	189.54	
11/03/97		30.90	32.16	1.26	188.51	
11/24/97		30.74	36.69	5.95	187.63	
12/12/97		28.90	29.31	0.41	190.70	
12/29/97		27.78	28.20	0.42	191.82	
01/12/98		26.96	27.30	0.34	192.65	
01/27/98		21.07	21.24	0.17	198.58	
02/10/98		26.45	27.30	0.85	193.05	
02/24/98		18.39	22.54	4.15	200.38	
03/12/98		20.88	28.23	7.35	197.18	
03/24/98		17.39	25.43	8.04	200.52	
04/13/98		17.23	22.98	5.75	201.19	
04/28/98		12.24	15.18	2.94	206.80	
05/15/98		11.36	15.84	4.48	207.34	
05/21/98		12.49	16.44	3.95	206.33	
06/08/98		19.60	25.70	6.10	198.74	
06/22/98		16.93	22.38	5.45	201.55	
07/06/98		16.46	19.20	2.74	202.62	
07/23/98		18.94	24.09	5.15	199.61	
08/11/98		NG	NG	NG		
08/24/98		22.15	23.12	0.97	197.33	
09/08/98		26.37	27.94	1.57	192.97	
09/14/98		28.30	28.64	0.34	191.31	
09/22/98		28.80	29.35	0.55	190.77	
10/05/98		29.93	30.80	0.87	189.57	
10/19/98		29.44	30.49	1.05	190.02	
11/13/98		29.70	30.68	0.98	189.77	
11/23/98		28.73	29.60	0.87	190.77	
12/07/98		29.70	30.90	1.20	189.72	
12/21/98		27.60	28.02	0.42	192.00	
01/05/99		33.97	34.45	0.48	185.61	
01/18/99		26.68	27.28	0.60	192.88	
01/25/99		22.90	22.96	0.06	196.78	
02/08/99		15.85	16.04	0.19	203.80	
02/22/99		16.13	16.62	0.49	203.45	
03/08/99		18.23	19.66	1.43	201.14	
03/29/99		17.84	18.79	0.95	201.64	
04/13/99		19.41	21.45	2.04	199.83	
04/26/99		17.10	17.55	0.45	202.49	
05/10/99		17.94	19.67	1.73	201.37	
05/24/99		20.03	21.92	1.89	199.24	
06/07/99		21.48	22.95	1.47	197.88	
06/30/99		23.43	24.05	0.62	196.12	
07/11/99		20.57	21.10	0.53	199.00	
07/26/99		23.68	24.20	0.52	195.89	
08/09/99		24.86	25.53	0.65	194.67	
08/23/99		26.15	26.97	0.82	193.36	
09/07/99		29.65	30.55	0.90	189.84	
09/27/99		31.90	33.00	1.10	187.55	

Notes:

PSH = Phase separated hydrocarbons

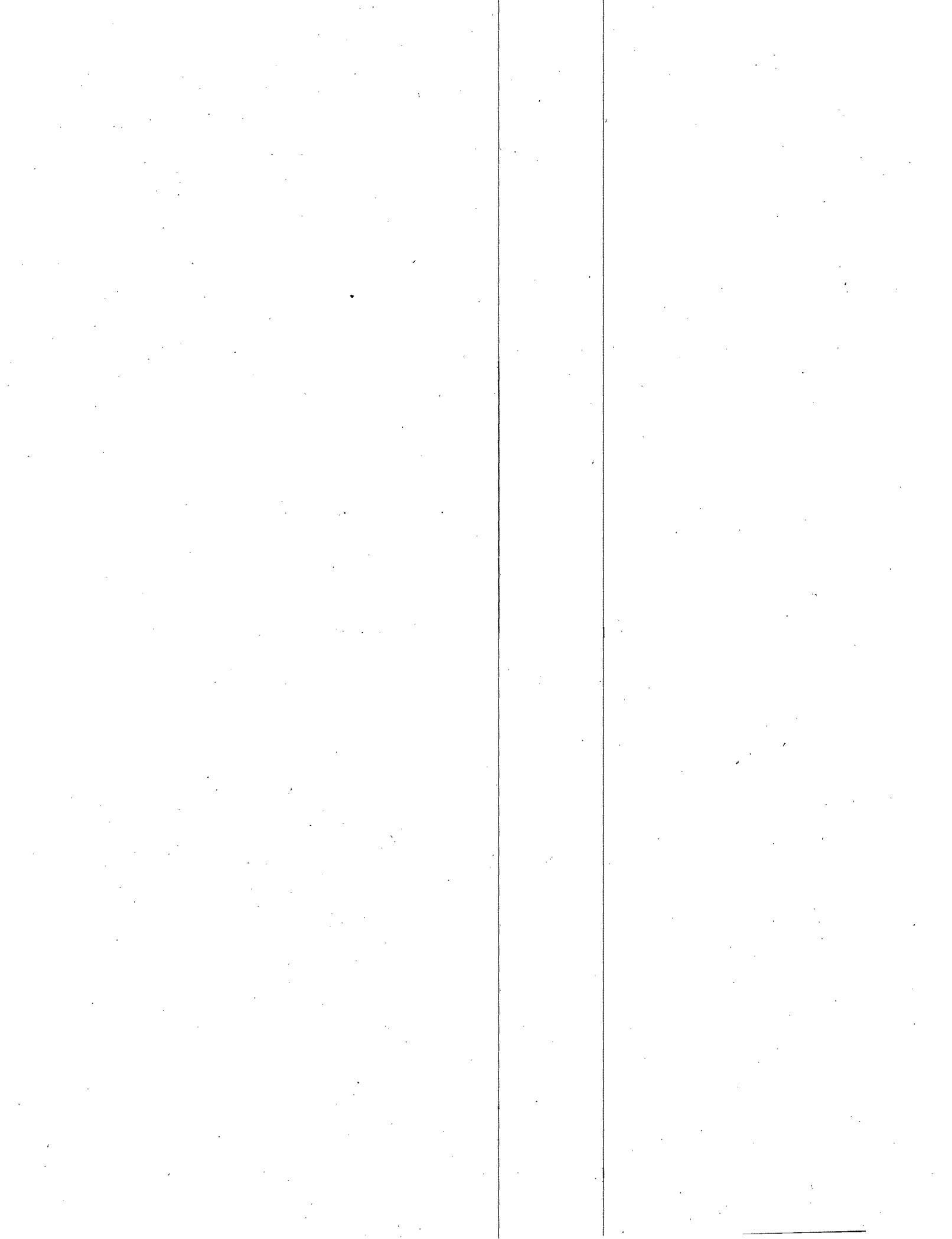
ND = Not detected

NG = Not gauged

Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

Potentiometric Surface Elevation = Top of Casing Elevation - Depth to Water + (Specific Gravity of PSH x PSH Thickness)

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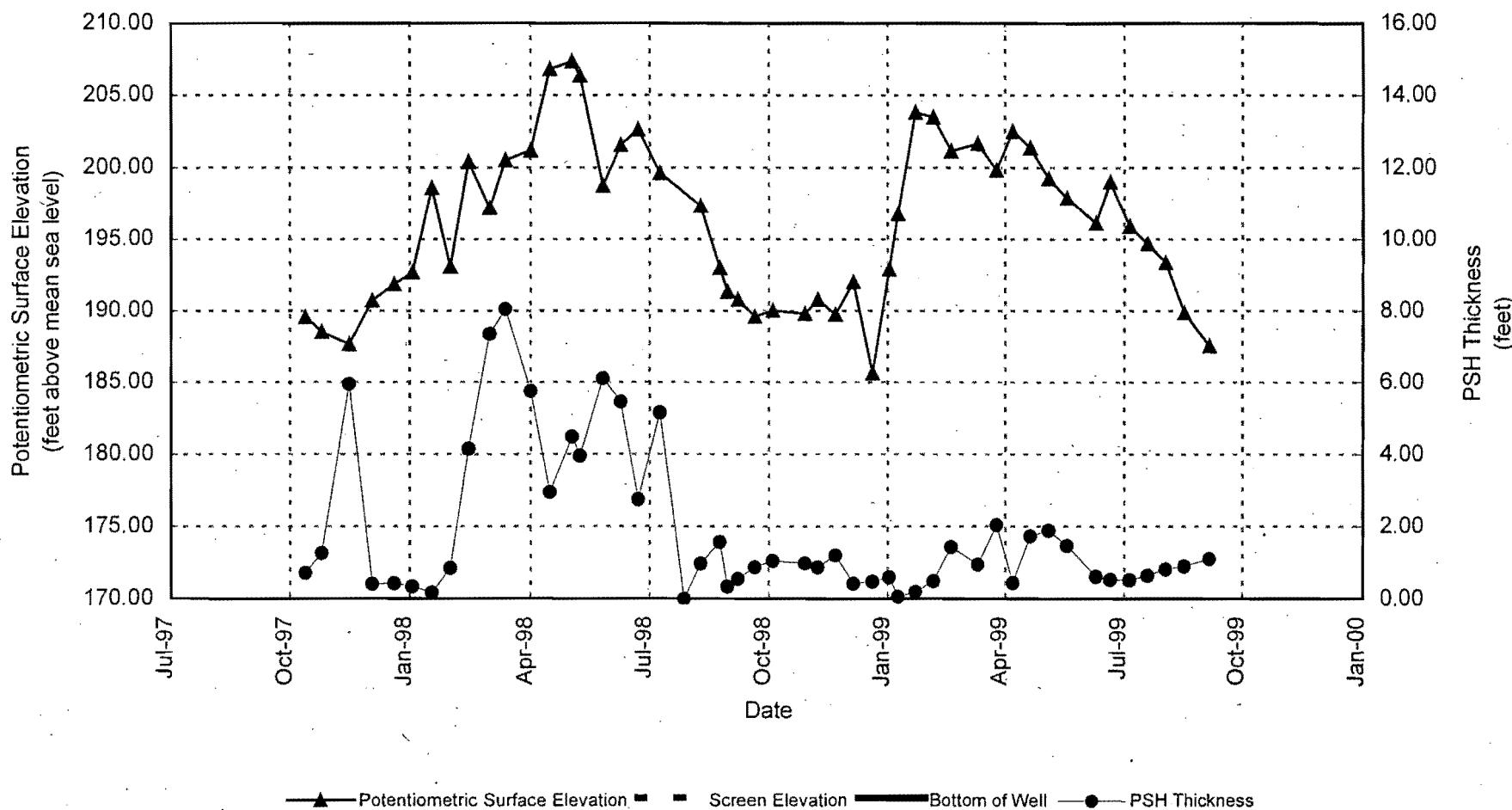
MONITORING DATA VS. TIME

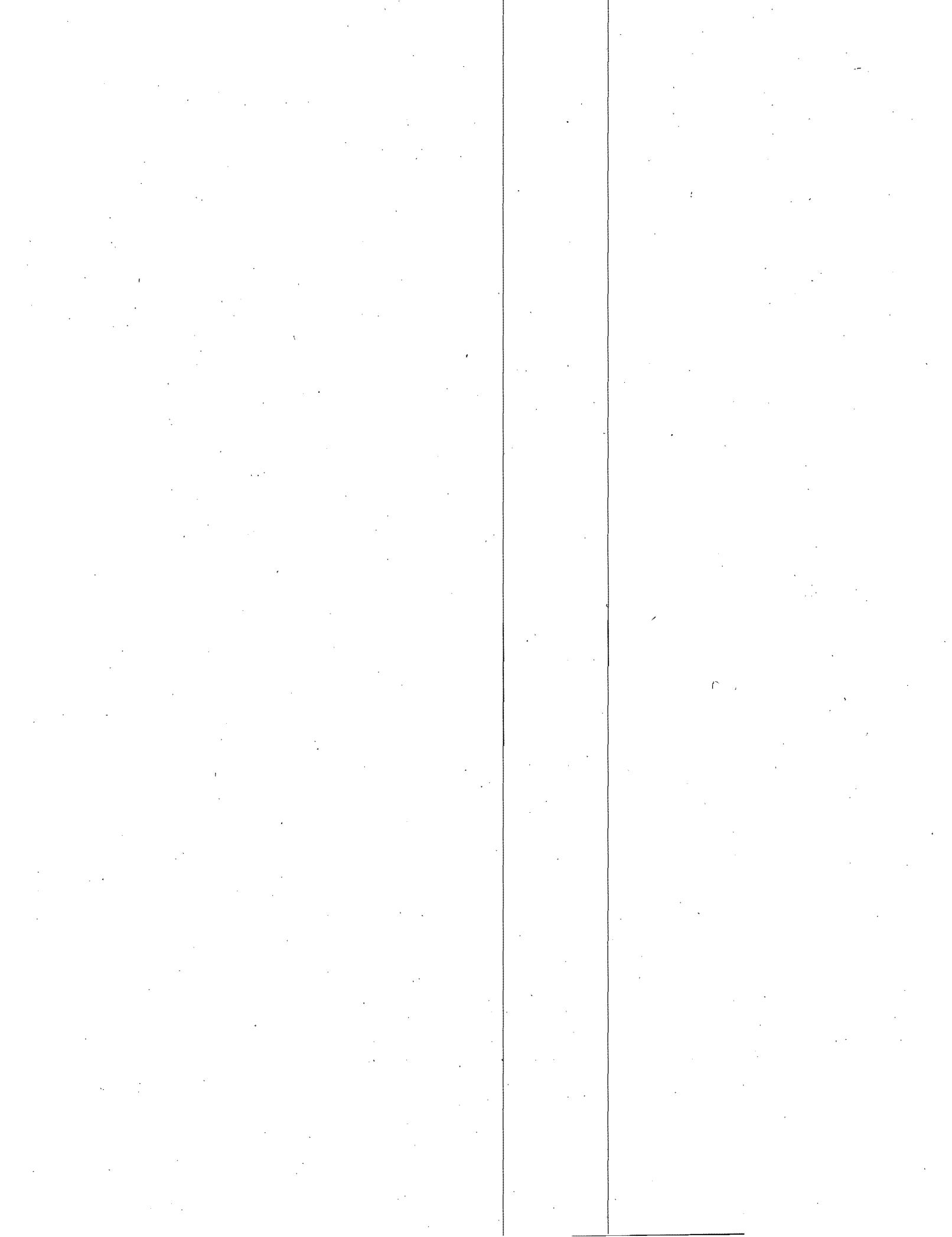
RW-4

WILLIAMS REFINING, L.L.C.

543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE

TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:	Measurements in Feet			
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
		Top of Casing Elevation	221.14	PSH S.G.	0.7788 Assumed, based on S.G. of LNAPL measured in B-1 (10/99)
RW-5		Depth to Screen	28.00		
		Well Depth	58.00		
10/20/97		35.91	37.55	1.64	184.87
11/03/97		ND	35.00	ND	186.14
11/25/97		ND	34.69	ND	186.45
12/12/97		ND	34.56	ND	186.58
12/29/97		ND	34.01	ND	187.13
01/12/98		ND	32.32	ND	188.82
01/27/98		ND	26.33	ND	194.81
02/10/98		ND	26.63	ND	194.51
02/24/98		ND	21.05	ND	200.09
03/12/98		22.58	23.74	1.16	198.30
03/25/98		20.05	21.23	1.18	200.83
04/13/98		ND	19.40	ND	201.74
04/28/98		ND	13.84	ND	207.30
05/15/98		ND	12.81	ND	208.33
05/22/98		14.93	15.08	0.15	206.18
06/08/98		ND	22.05	ND	199.09
06/22/98		ND	18.36	ND	202.78
07/06/98		ND	17.99	ND	203.15
07/23/98		21.70	21.84	0.14	199.41
08/11/98		ND	23.28	ND	197.86
08/24/98		NG	NG	NG	
09/08/98		ND	28.60	ND	192.54
09/14/98		ND	29.43	ND	191.71
09/22/98		ND	28.26	ND	192.88
10/05/98		ND	28.80	ND	192.34
10/19/98		ND	30.72	ND	190.42
11/13/98		ND	30.32	ND	190.82
11/23/98		ND	28.72	ND	192.42
12/07/98		31.18	31.28	0.10	189.94
12/21/98		ND	27.73	ND	193.41
01/05/99		ND	29.02	ND	192.12
01/18/99		ND	25.70	ND	195.44
01/25/99		ND	21.44	ND	199.70
02/08/99		ND	14.06	ND	207.08
02/22/99		ND	16.89	ND	204.25
03/08/99		20.02	20.05	0.03	201.11
03/29/99		ND	17.99	ND	203.15
04/13/99		ND	21.56	ND	199.58
04/26/99		ND	17.90	ND	203.24
05/10/99		ND	16.60	ND	204.54
05/24/99		ND	21.57	ND	199.57
06/07/99		ND	22.88	ND	198.26
06/30/99		24.91	24.93	0.02	196.23
07/11/99		ND	23.75	ND	197.39
07/26/99		ND	27.66	ND	193.48
08/09/99		ND	27.10	ND	194.04
08/23/99		ND	29.24	ND	191.90
09/07/99		ND	30.76	ND	190.38
09/27/99		ND	30.65	ND	190.49

Notes:

PSH = Phase separated hydrocarbons

ND = Not detected

NG = Not gauged

Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

Potentiometric Surface Elevation = Top of Casing Elevation - Depth to Water + (Specific Gravity of PSH x PSH Thickness)

C
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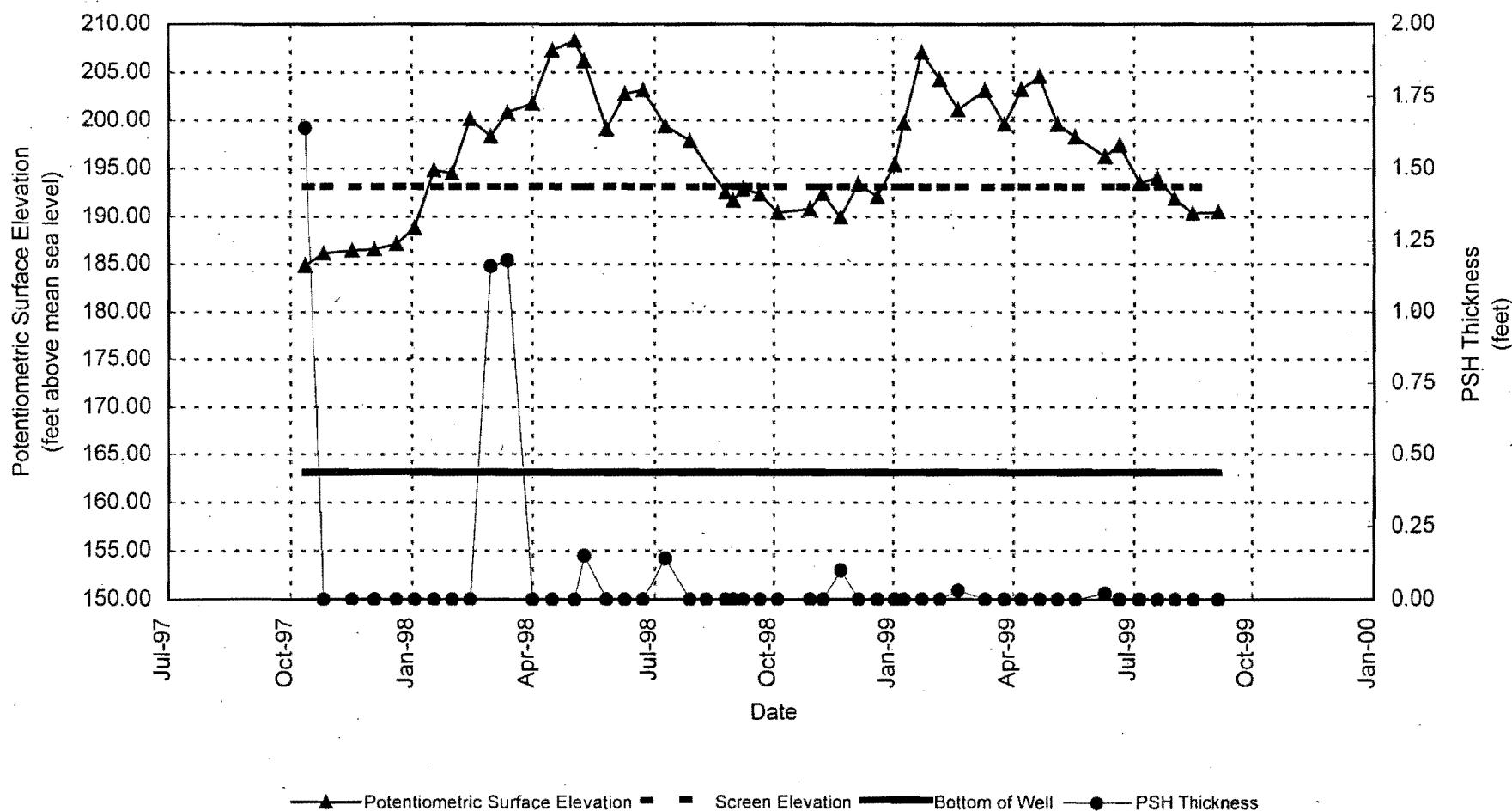
MONITORING DATA VS. TIME

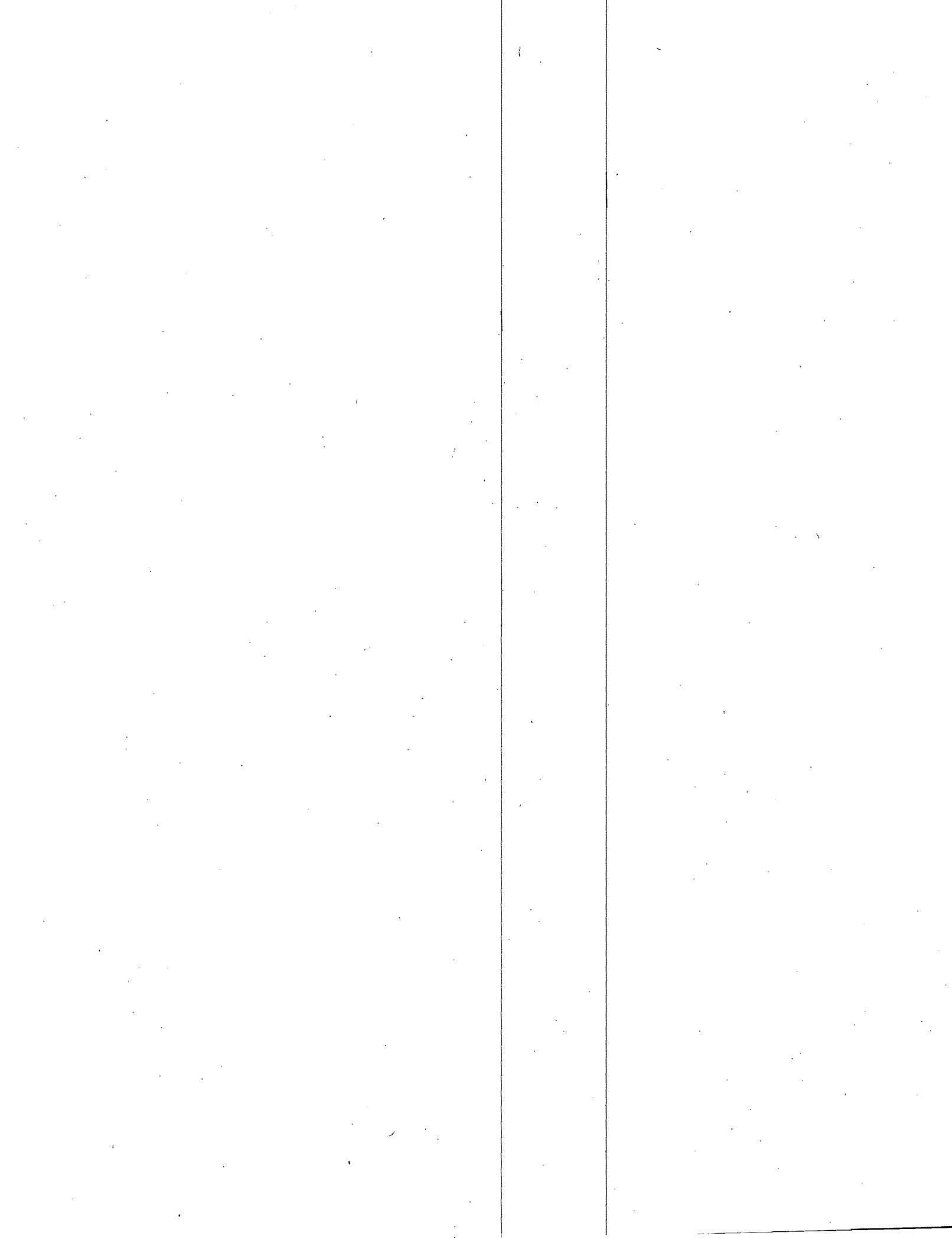
RW-5

WILLIAMS REFINING, L.L.C.

543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE

TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:				
		Top of Casing Elevation	219.62	PSH S.G.	0.7788
RW-6		Depth to Screen	25.10	Assumed, based on S.G. of LNAPL measured in B-1 (10/99)	
Measurements in Feet					
Monitoring Date	Notes	Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
10/20/97		35.02	35.36	0.34	184.52
11/03/97		33.71	33.89	0.18	185.87
11/25/97		32.31	32.59	0.28	187.25
12/12/97		29.33	29.47	0.14	190.26
12/29/97		28.63	28.78	0.15	190.96
01/12/98		27.56	27.60	0.04	192.05
01/27/98		ND	22.33	ND	197.29
02/10/98		15.84	17.00	1.16	203.52
02/24/98		27.41	27.43	0.02	192.21
03/12/98		26.39	26.49	0.10	193.21
03/25/98		24.45	24.55	0.10	195.15
04/13/98		ND	20.93	ND	198.69
04/28/98		17.25	17.30	0.05	202.36
05/15/98		ND	16.75	ND	202.87
05/22/98		19.53	19.68	0.15	200.06
06/08/98		29.13	29.18	0.05	190.48
06/22/98		26.20	26.40	0.20	193.38
07/06/98		ND	24.95	ND	194.67
07/23/98		25.27	25.50	0.23	194.30
08/11/98		27.50	27.70	0.20	192.08
08/24/98		NG	NG	NG	
09/08/98		30.68	31.00	0.32	188.87
09/14/98		33.51	33.73	0.22	186.06
09/22/98		35.84	36.10	0.26	183.72
10/05/98		38.22	38.25	0.03	181.39
10/19/98		39.97	40.22	0.25	179.59
11/13/98		42.33	42.68	0.35	177.21
11/23/98		38.92	39.19	0.27	180.64
12/07/98		34.95	35.90	0.95	184.46
12/21/98		28.24	28.77	0.53	191.26
01/05/99		34.18	34.82	0.64	185.30
01/18/99		28.08	28.73	0.65	191.40
01/25/99		ND	25.27	ND	194.35
02/08/99		17.64	18.10	0.46	201.88
02/22/99		ND	19.44	ND	200.18
03/08/99		21.20	21.64	0.44	198.32
03/29/99		ND	18.30	ND	201.32
04/13/99		24.95	25.45	0.50	194.56
04/26/99		ND	22.98	ND	196.64
05/10/99		25.10	25.69	0.59	194.39
05/24/99		ND	18.33	ND	201.29
06/07/99		19.73	19.77	0.04	199.88
06/30/99		ND	21.77	ND	197.85
07/11/99		21.05	21.07	0.02	198.57
07/26/99		23.72	24.02	0.30	195.83
08/09/99		24.85	24.88	0.03	194.76
08/23/99		26.77	26.97	0.20	192.81
09/07/99		40.46	40.77	0.31	179.09
09/27/99		43.25	43.26	0.01	176.37

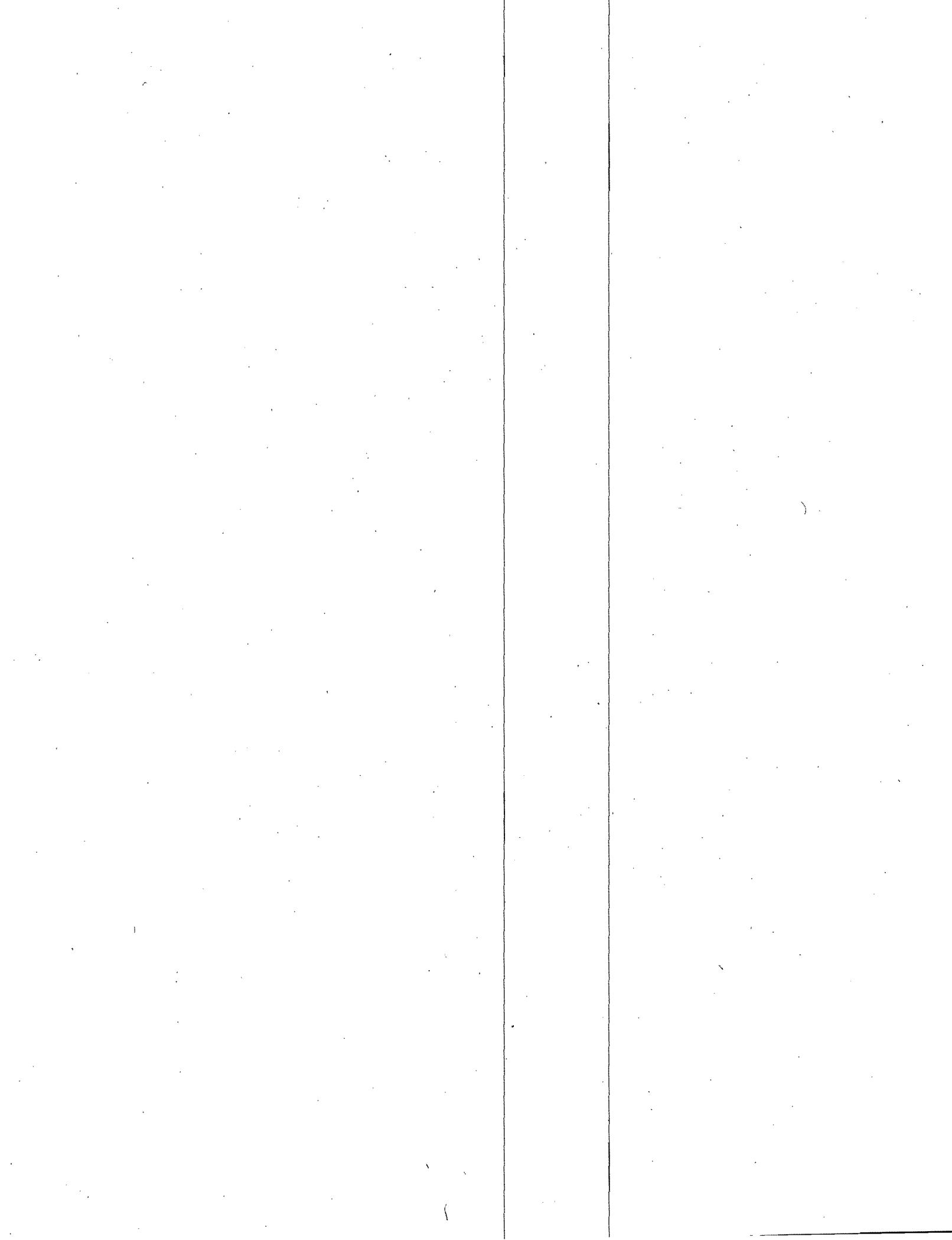
Notes:

PSH = Phase separated hydrocarbons

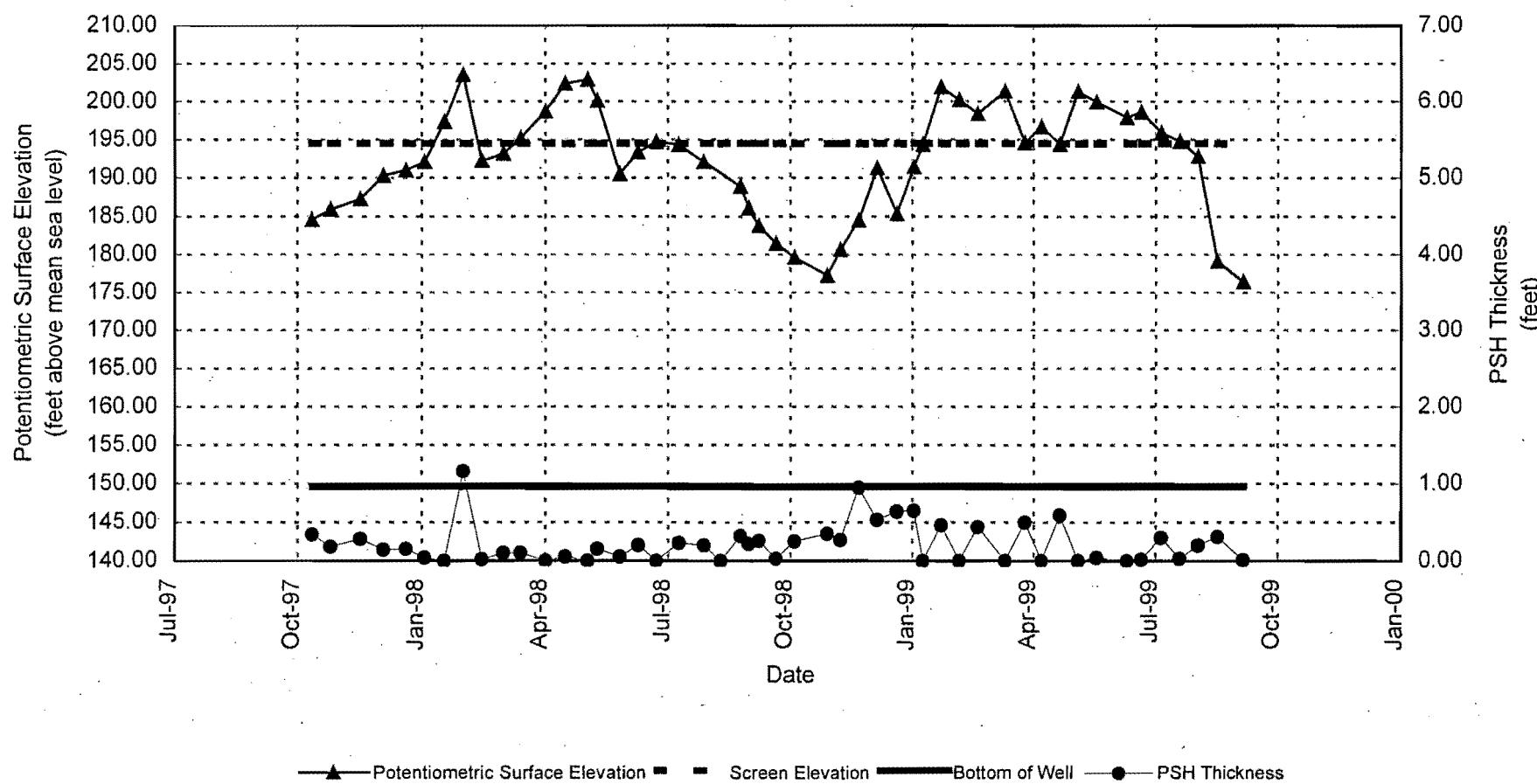
ND = Not detected NG = Not gauged

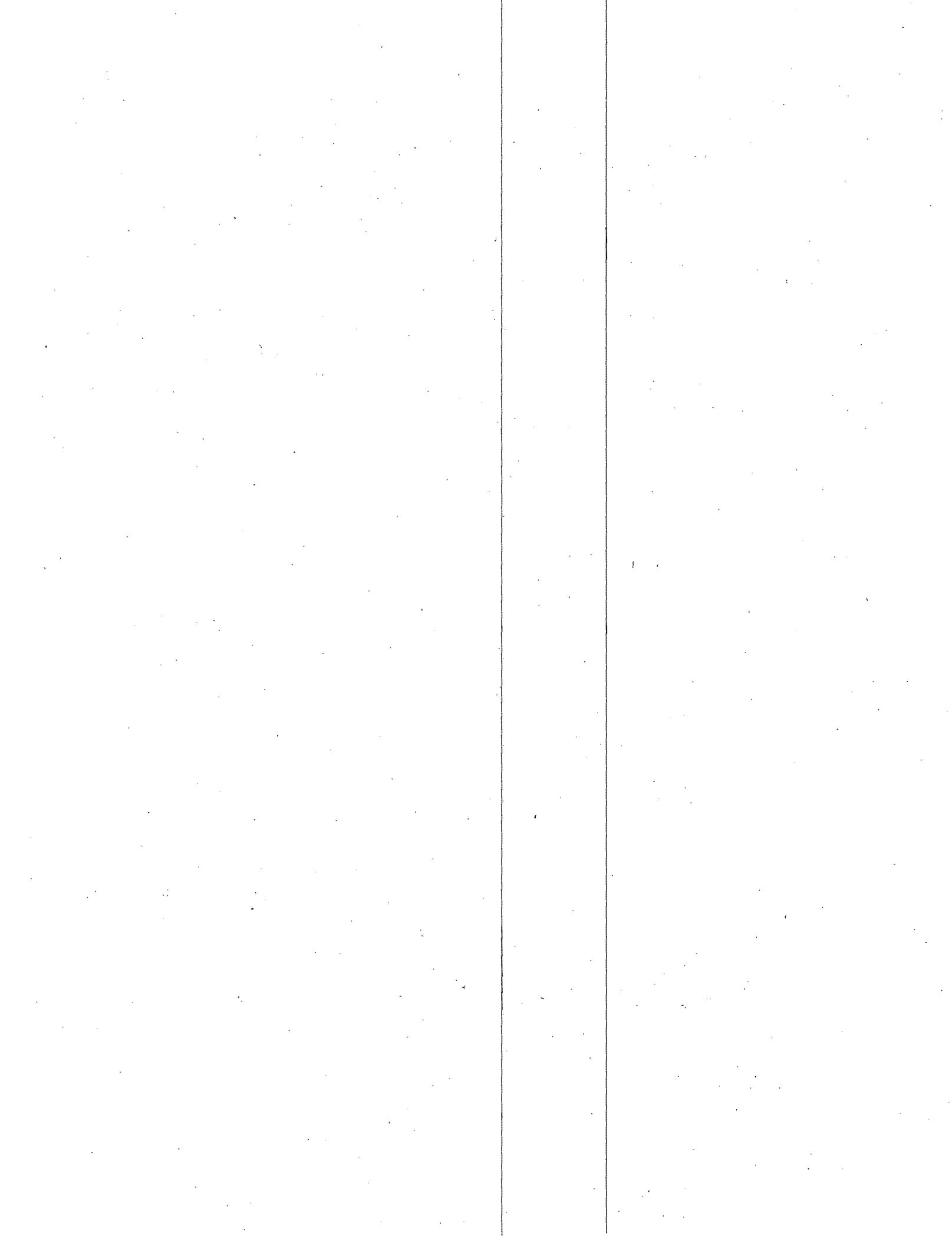
Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

$$\text{Potentiometric Surface Elevation} = \text{Top of Casing Elevation} - \text{Depth to Water} + (\text{Specific Gravity of PSH} \times \text{PSH Thickness})$$



MONITORING DATA VS. TIME
RW-6
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE
TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:	Measurements in Feet			
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
		Top of Casing Elevation	217.60	PSH S.G.	0.8265 Measured 10/99
RW-8		Depth to Screen Well Depth	2.50 45.00		
10/20/97		ND	41.50	ND	176.10
11/03/97		19.73	20.05	0.32	197.81
11/25/97		20.11	20.54	0.43	197.42
12/12/97		26.18	26.53	0.35	191.36
12/29/97		25.80	28.40	2.60	191.35
01/12/98		15.80	19.28	3.48	201.20
01/27/98		12.75	16.31	3.56	204.23
02/10/98		15.84	17.00	1.16	201.56
02/24/98		21.67	23.86	2.19	195.55
03/12/98		29.70	32.70	3.00	187.38
03/25/98		30.15	33.80	3.65	186.82
04/13/98		18.61	21.65	3.04	198.46
04/28/98		14.64	23.55	8.91	201.41
05/15/98		15.55	20.50	4.95	201.19
05/22/98		16.70	22.00	5.30	199.98
06/08/98		21.42	22.02	0.60	196.08
06/22/98		19.40	21.98	2.58	197.75
07/06/98		19.55	22.95	3.40	197.46
07/23/98		19.82	22.85	3.03	197.25
08/11/98		19.54	22.40	2.86	197.56
08/24/98		NG	NG	NG	
09/08/98		24.67	24.97	0.30	192.88
09/14/98		25.18	25.48	0.30	192.37
09/22/98		25.28	25.44	0.16	192.29
10/05/98		25.65	25.72	0.07	191.94
10/19/98		24.10	24.15	0.05	193.49
11/13/98		23.10	23.13	0.03	194.49
11/23/98		17.66	17.81	0.15	199.91
12/07/98		20.55	22.02	1.47	196.79
12/21/98		15.60	21.15	5.55	201.04
01/05/99		21.44	21.80	0.36	196.10
01/18/99		ND	22.28	ND	195.32
01/25/99		15.80	16.26	0.46	201.72
02/08/99		11.88	12.38	0.50	205.63
02/22/99		12.08	18.69	6.61	204.37
03/08/99		13.74	13.85	0.11	203.84
03/29/99		9.32	13.96	4.64	207.47
04/13/99		13.05	16.05	3.00	204.03
04/26/99		11.72	11.90	0.18	205.85
05/10/99		20.28	21.20	0.92	197.16
05/24/99		21.93	22.87	0.94	195.51
06/07/99		19.68	21.38	1.70	197.63
06/30/99		23.75	24.70	0.95	193.69
07/11/99		22.34	22.51	0.17	195.23
07/26/99		24.90	30.17	5.27	191.79
08/09/99		18.05	22.98	4.93	198.69
08/23/99		20.78	22.20	1.42	196.57
09/07/99		26.50	28.12	1.62	190.82
09/27/99		22.50	23.00	0.50	195.01

Notes:

PSH = Phase separated hydrocarbons

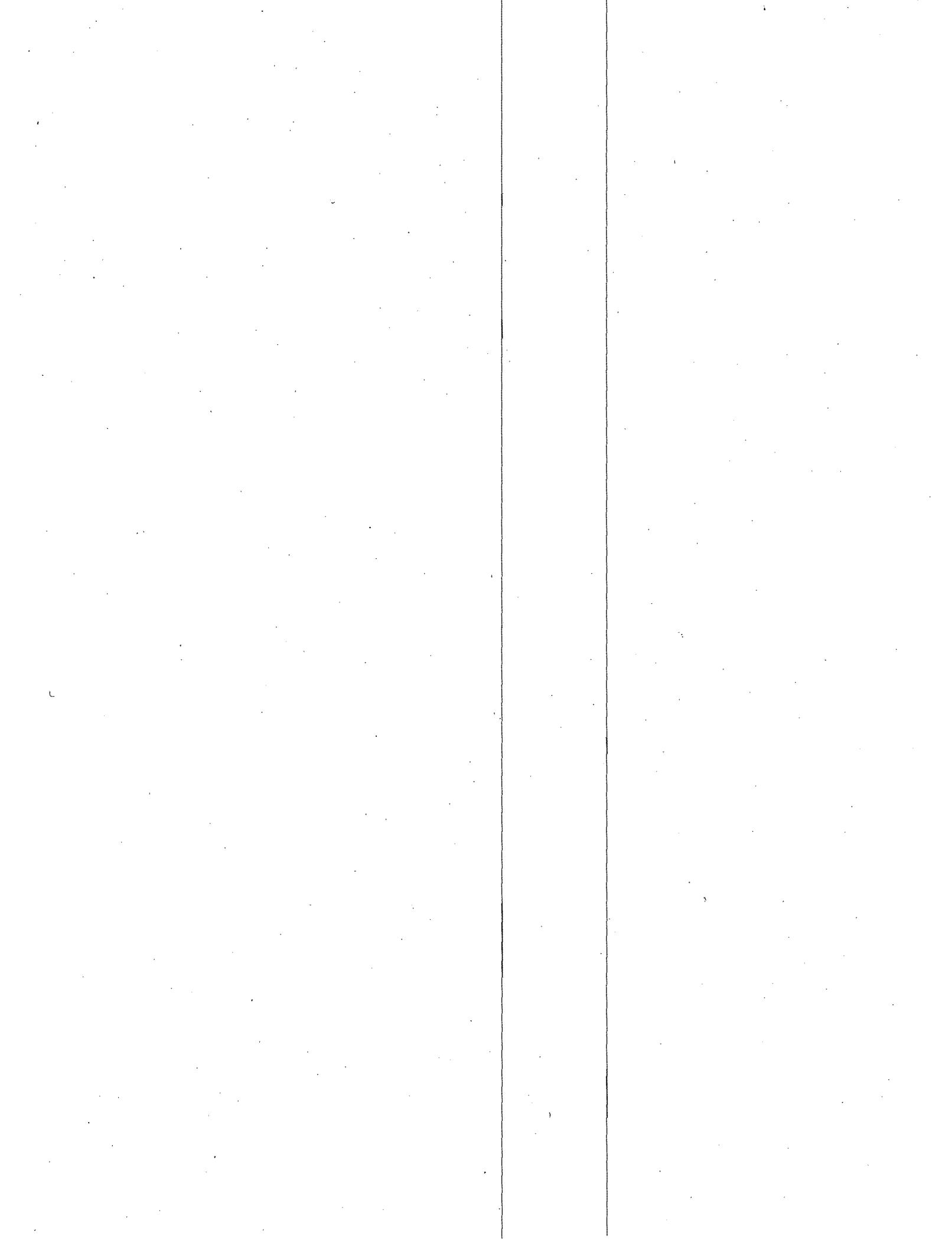
ND = Not detected

NG = Not gauged

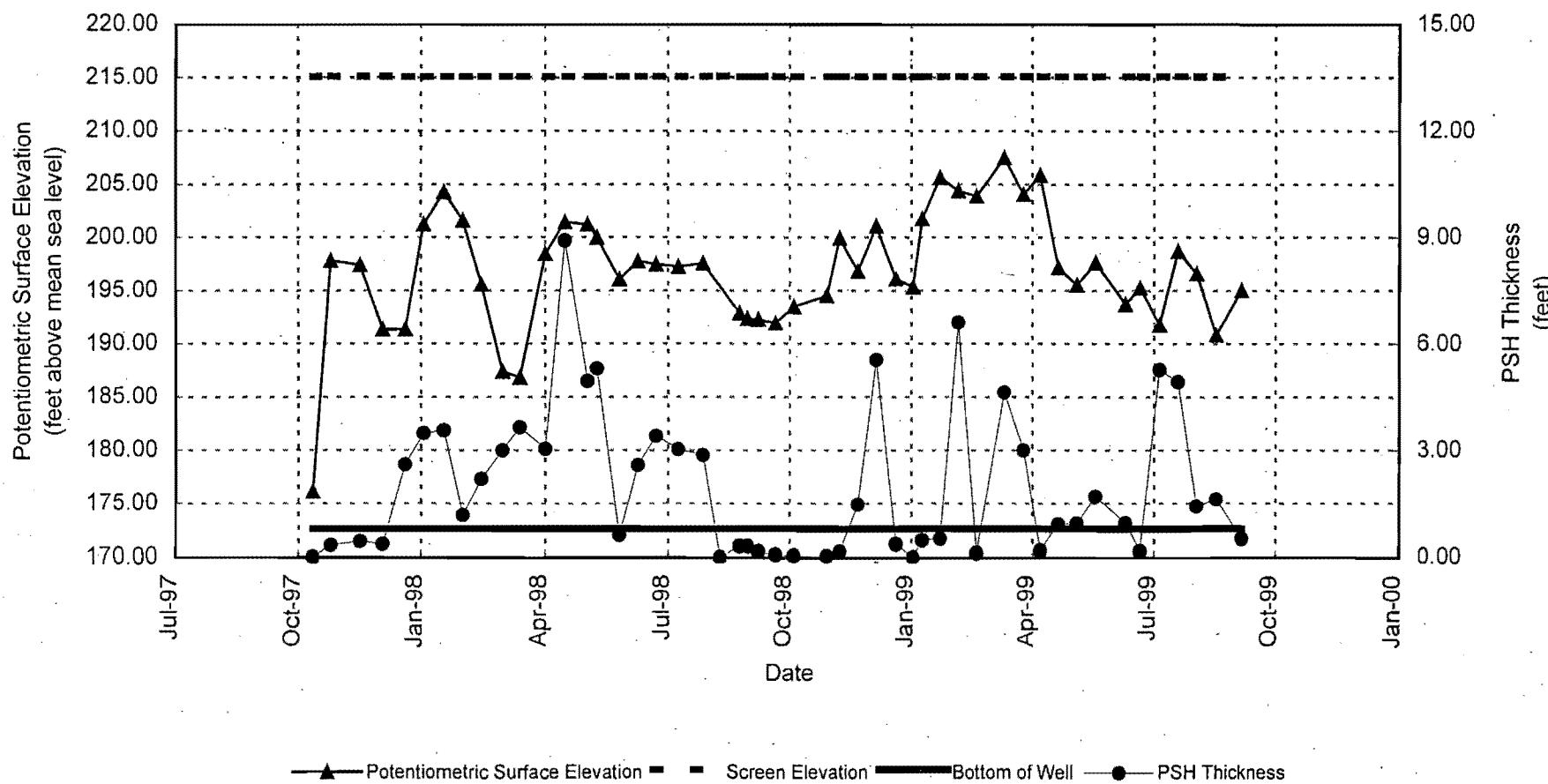
Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

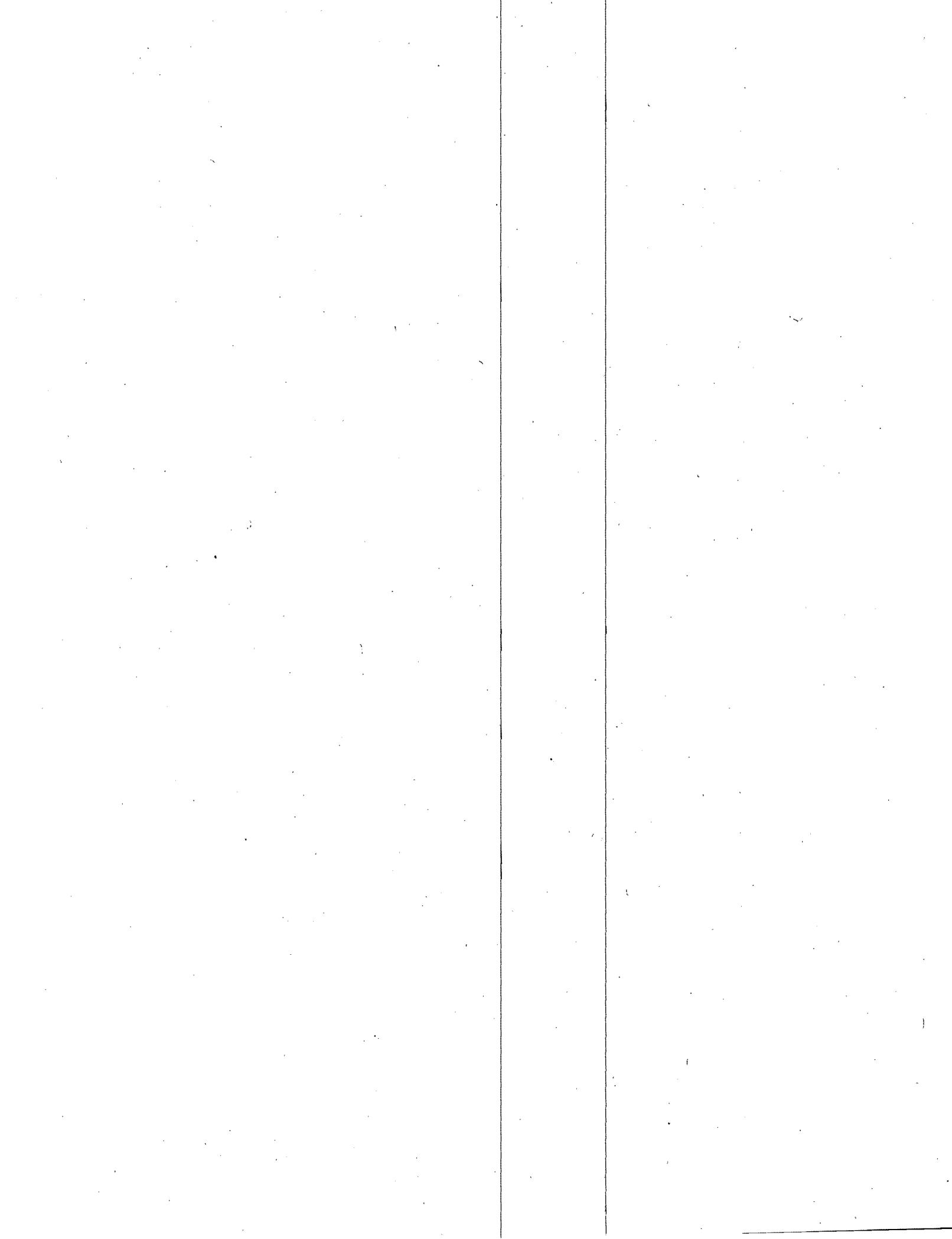
Potentiometric Surface Elevation = Top of Casing Elevation - Depth to Water + (Specific Gravity of PSH x PSH Thickness)

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MONITORING DATA VS. TIME
RW-8
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE
TDEC ID NO. 9-791214





APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:	Top of Casing Elevation	239.70	PSH S.G.	0.80	Assumed, LNAPL S.G. not measured in area
		Depth to Screen	not available			
Monitoring Date	Notes	Measurements in Feet				
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation	
10/20/97						
11/03/97						
11/25/97		ND	50.46	ND	189.24	
12/12/97		50.80	51.48	0.68	188.76	
12/29/97		50.87	51.93	1.06	188.62	
01/12/98		NG	NG	NG		
01/27/98		45.45	45.68	0.23	194.20	
02/10/98		52.72	53.45	0.73	186.83	
02/24/98		49.02	50.28	1.26	190.43	
03/12/98		48.08	49.40	1.32	191.36	
03/25/98		38.58	40.16	1.58	200.80	
04/13/98		37.25	37.30	0.05	202.44	
04/28/98		37.58	38.38	0.80	201.96	
05/15/98		28.97	29.78	0.81	210.57	
05/22/98		34.40	35.37	0.97	205.11	
06/08/98		37.65	38.93	1.28	201.79	
06/22/98		41.70	43.05	1.35	197.73	
07/06/98		33.81	35.18	1.37	205.62	
07/23/98		41.25	41.27	0.02	198.45	
08/11/98		47.25	47.37	0.12	192.43	
08/24/98		NG	NG	NG		
09/08/98		51.20	51.36	0.16	188.47	
09/14/98		52.75	52.85	0.10	186.93	
09/22/98		ND	48.81	ND	190.89	
10/05/98		49.60	49.66	0.06	190.09	
10/19/98		ND	49.05	ND	190.65	
11/13/98		53.90	53.94	0.04	185.79	
11/23/98		53.93	54.85	0.92	185.59	
12/07/98		55.65	55.83	0.18	184.01	
12/21/98		48.79	49.25	0.46	190.82	
01/05/99		55.21	56.02	0.81	184.33	
01/18/99		48.38	48.67	0.29	191.26	
01/25/99		46.35	46.65	0.30	193.29	
02/08/99		40.42	40.97	0.55	199.17	
02/22/99		40.43	41.00	0.57	199.16	
03/08/99		43.50	44.10	0.60	196.08	
03/29/99		41.79	42.45	0.66	197.78	
04/13/99		45.26	46.10	0.84	194.27	
04/26/99		44.24	45.11	0.87	195.29	
05/10/99		43.24	43.35	0.11	196.44	
05/24/99		44.60	45.85	1.25	194.85	
06/07/99		43.43	43.60	0.17	196.24	
06/30/99		48.51	48.79	0.28	191.13	
07/11/99		48.44	48.70	0.26	191.21	
07/26/99		51.33	51.67	0.34	188.30	
08/09/99		45.95	46.13	0.18	193.71	
08/23/99		56.70	56.95	0.25	182.95	
09/07/99		ND	50.14	ND	189.56	
09/27/99		52.38	52.39	0.01	187.32	

Notes:

PSH = Phase separated hydrocarbons

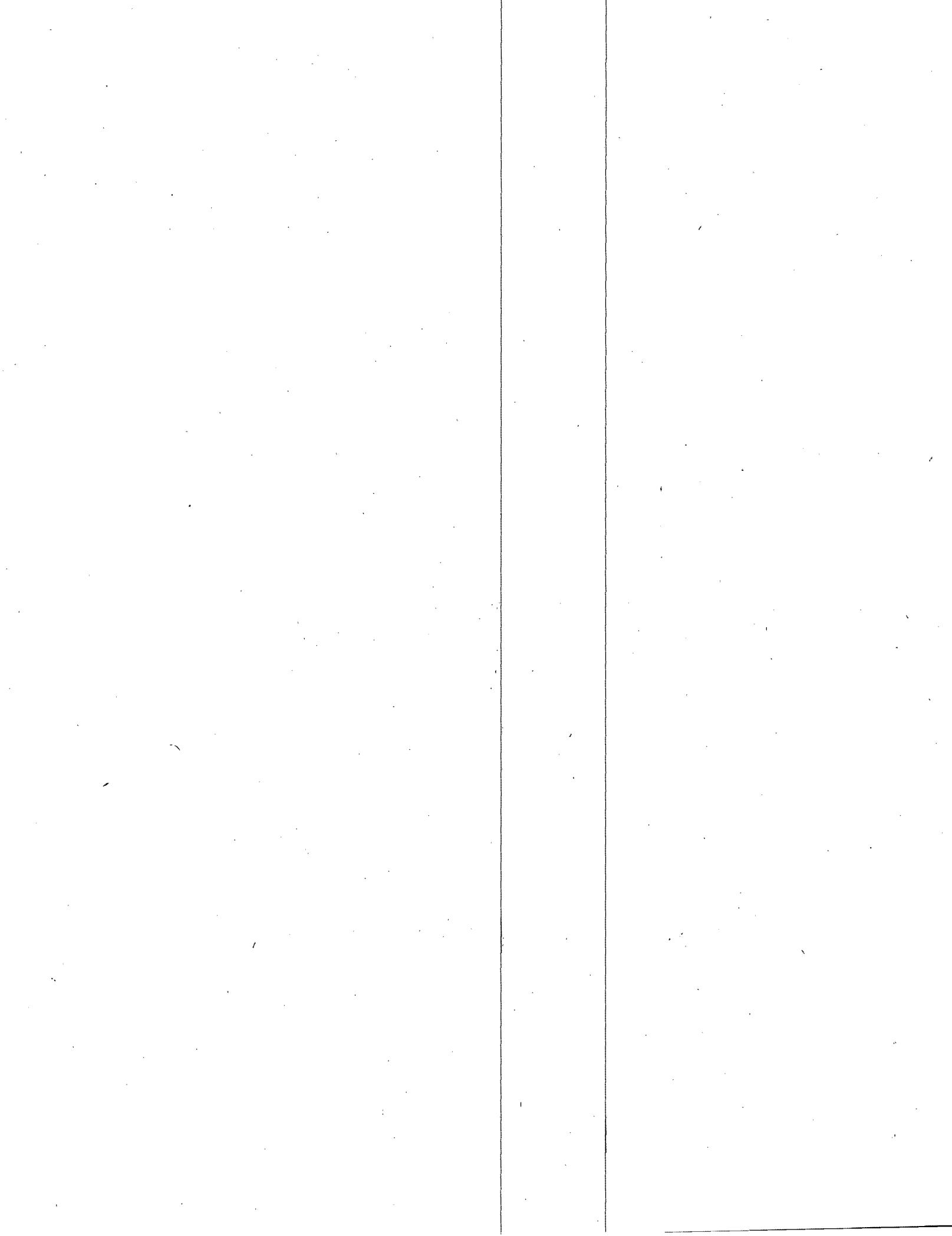
ND = Not detected

NG = Not gauged

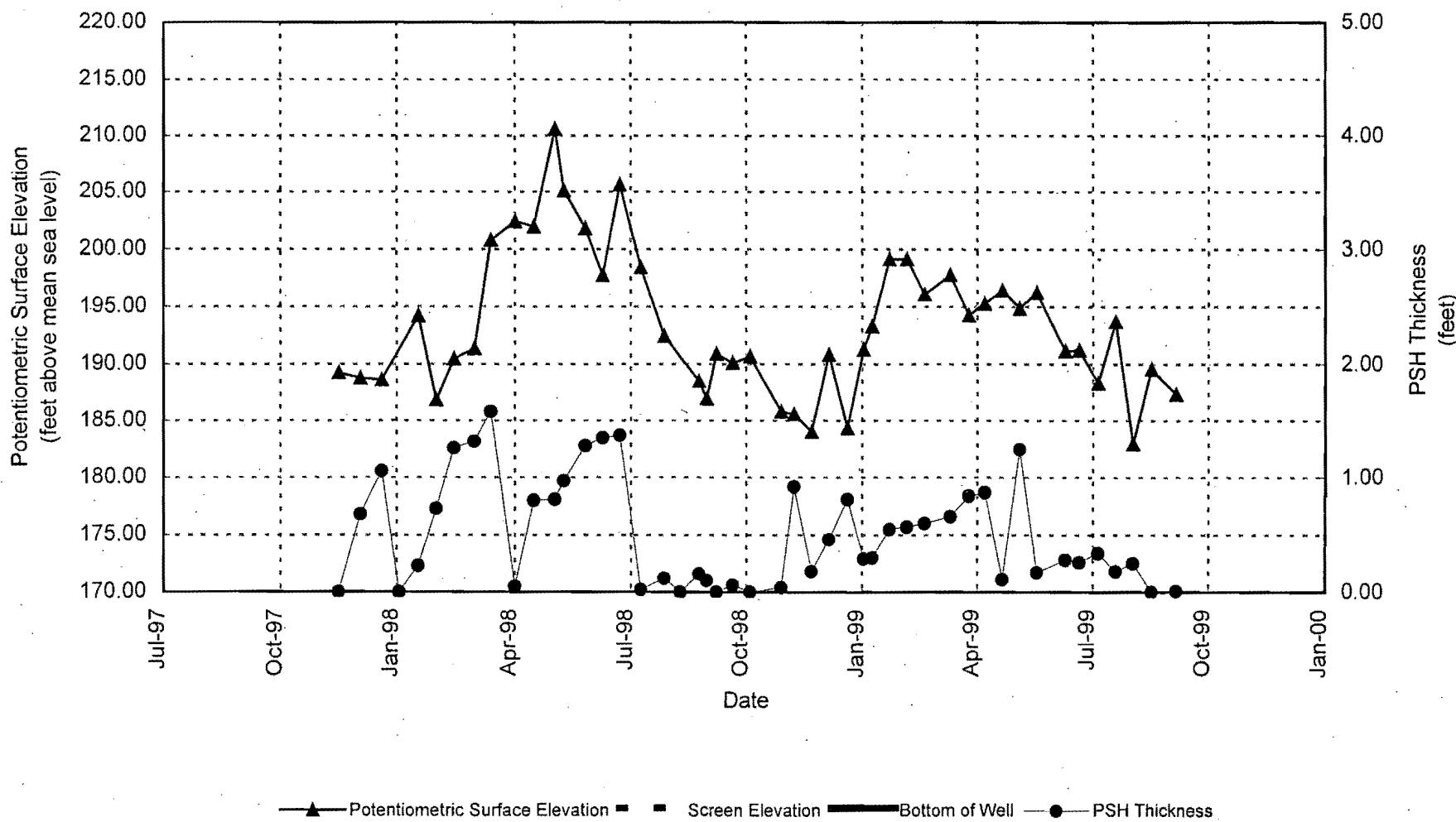
Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

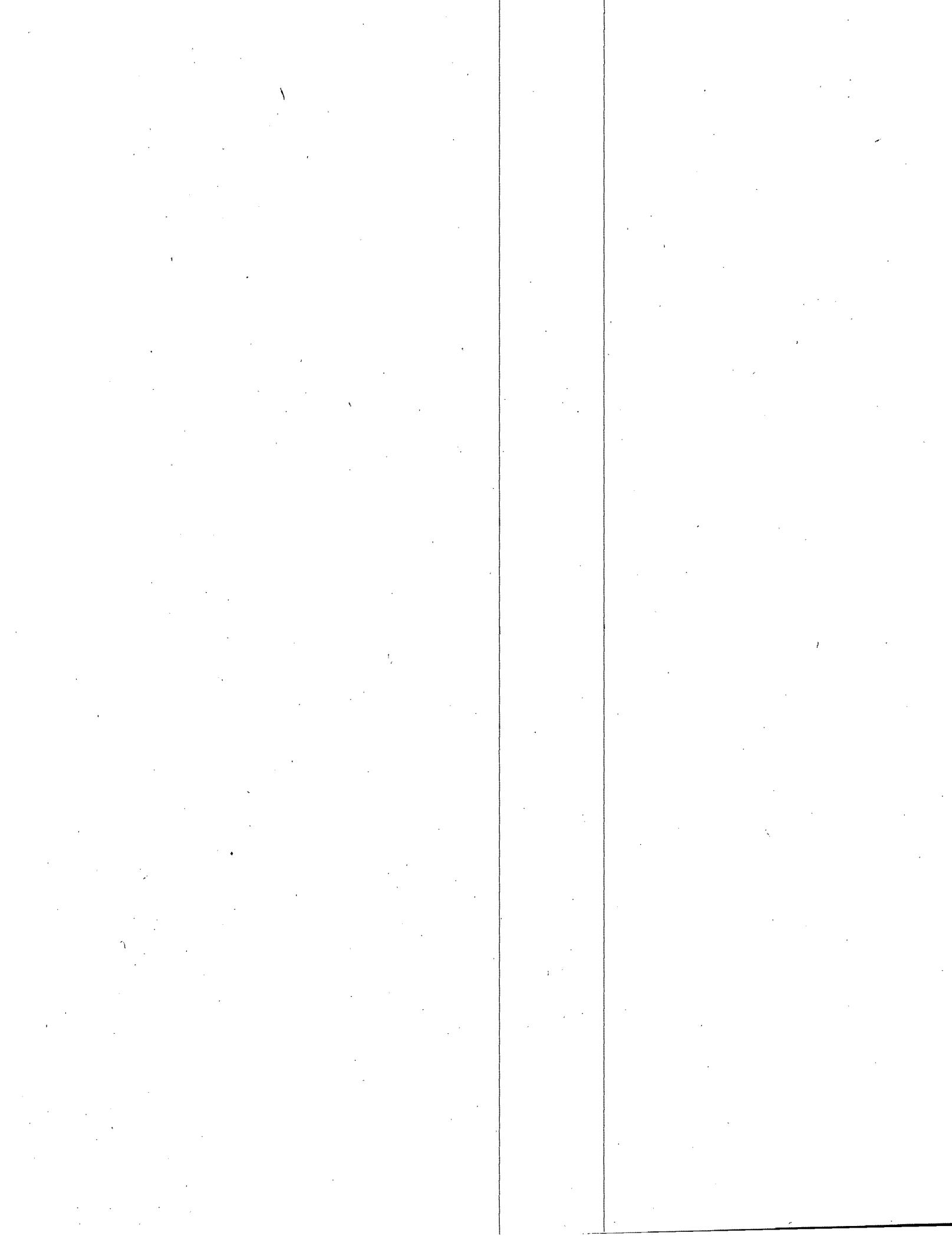
Potentiometric Surface Elevation = Top of Casing Elevation - Depth to Water + (Specific Gravity of PSH x PSH Thickness)

O:\WILLIAMS\REFINERY\DATA\RWT-12.XLS



MONITORING DATA VS. TIME
RW-10
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE
TDEC ID NO. 9-791214

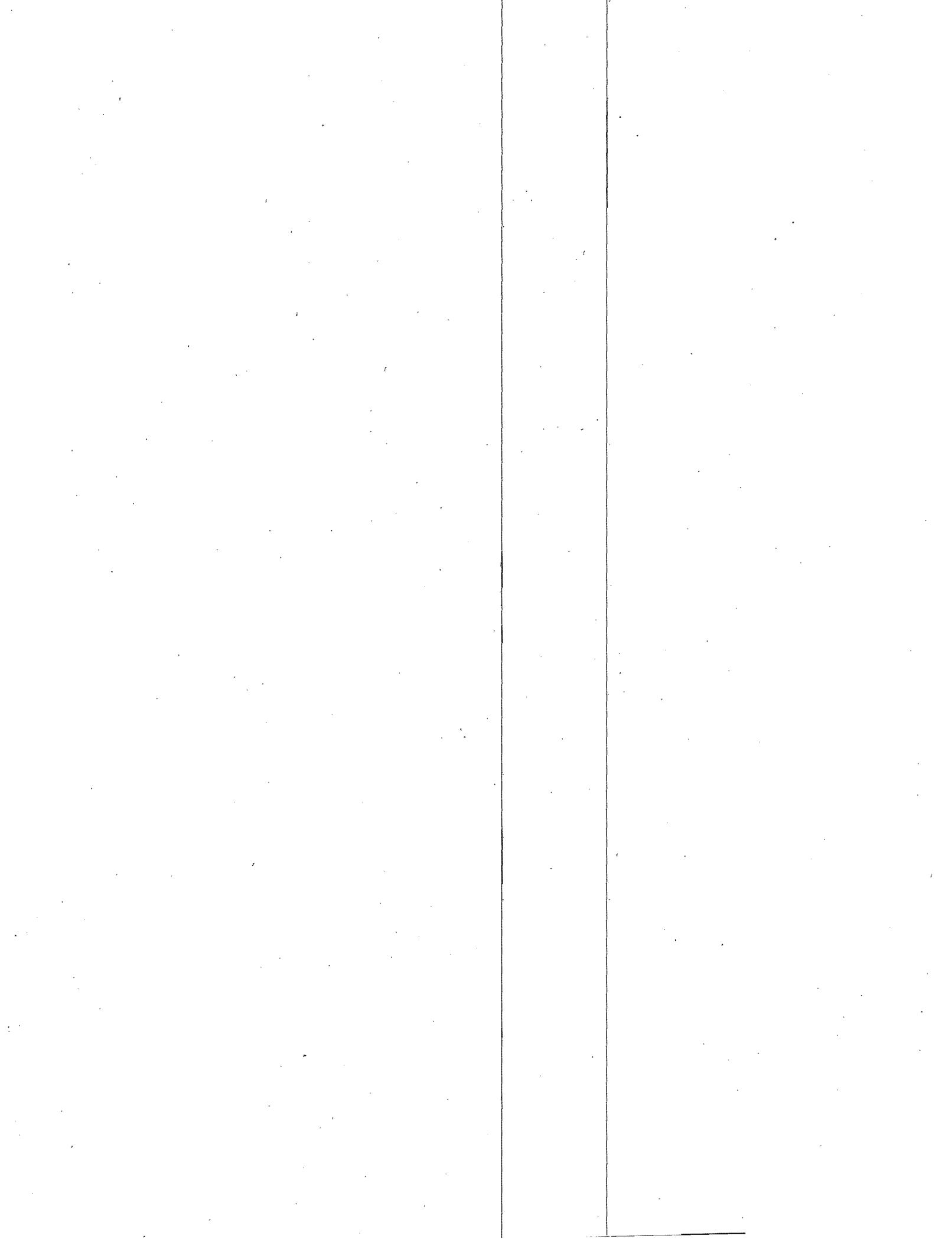




APPENDIX D
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:	Measurements in Feet				
		Depth to Notes	PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation
RW-12		Top of Casing Elevation	219.16		PSH S.G. 0.7420	Assumed, based on S.G. of LNAPL measured in OW-27 (10/99)
		Depth to Screen	3.00			
		Well Depth	61.00			
10/20/97						
11/03/97						
11/25/97						
12/12/97						
12/29/97						
01/12/98						
01/27/98						
02/10/98		14.97		15.05	0.08	204.17
09/22/98		ND		35.60	ND	183.56
01/25/99		12.65		12.90	0.25	206.45
02/08/99		9.60		9.99	0.39	209.46
02/22/99		10.60		10.98	0.38	208.46
03/08/99		37.48		38.34	0.86	181.46
03/29/99		ND		36.25	ND	182.91
04/13/99		34.60		35.75	1.15	184.26
04/26/99		ND		33.75	ND	185.41
05/10/99		35.45		36.44	0.99	183.45
05/24/99		34.15		35.05	0.90	184.78
06/07/99		35.83		35.93	0.10	183.30
06/30/99		36.00		36.50	0.50	183.03
07/11/99		34.35		35.05	0.70	184.63
07/26/99		14.52		14.82	0.30	204.56
08/09/99		ND		34.65	ND	184.51
08/23/99		ND		34.70	ND	184.46
09/07/99		ND		34.70	ND	184.46
09/27/99		ND		34.16	ND	185.00

Notes:
 PSH = Phase separated hydrocarbons
 ND = Not detected NG = Not gauged
 Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:
 Potentiometric Surface Elevation = Top of Casing Elevation - Depth to Water + (Specific Gravity of PSH x PSH Thickness)



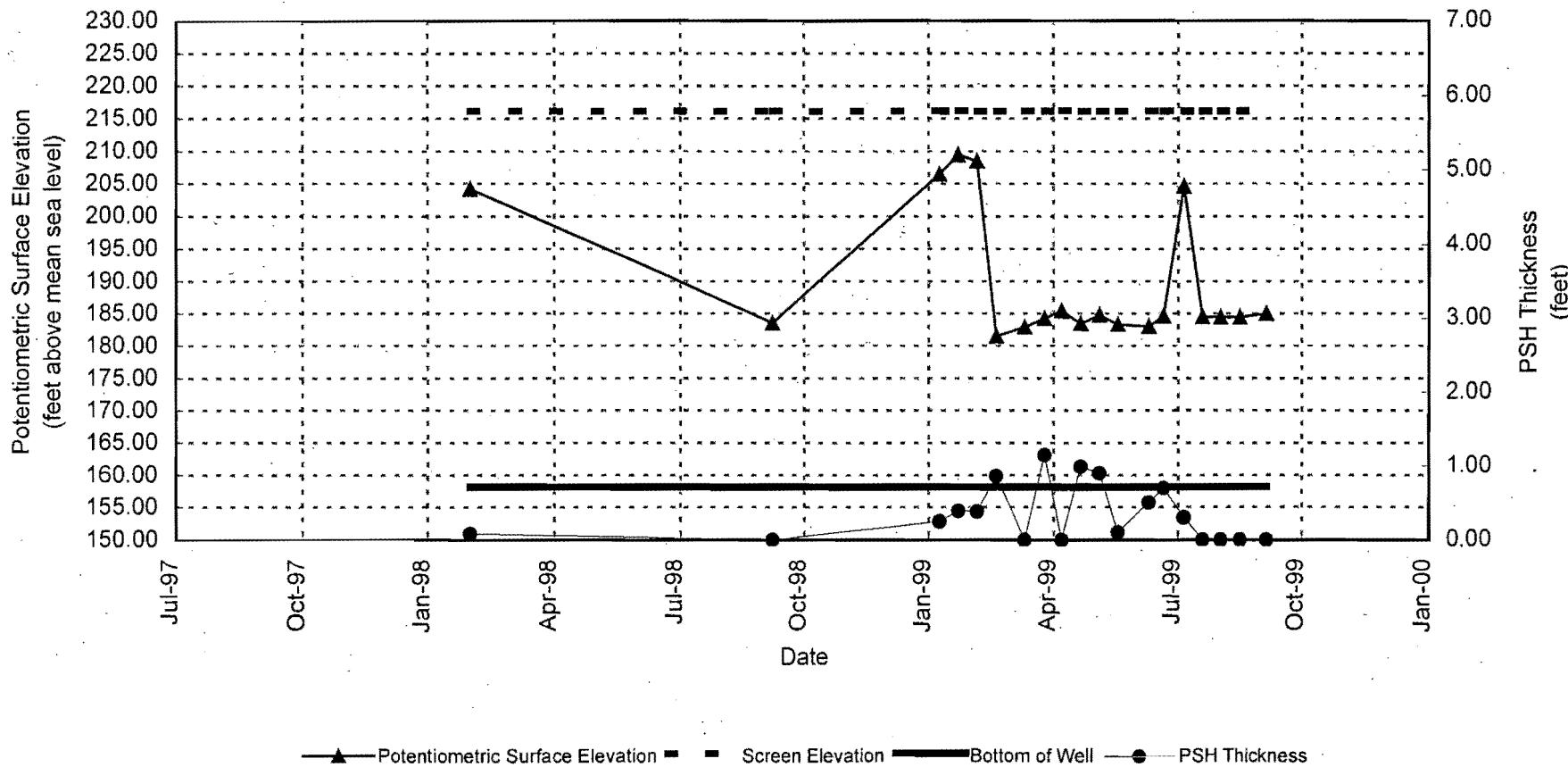
MONITORING DATA VS. TIME

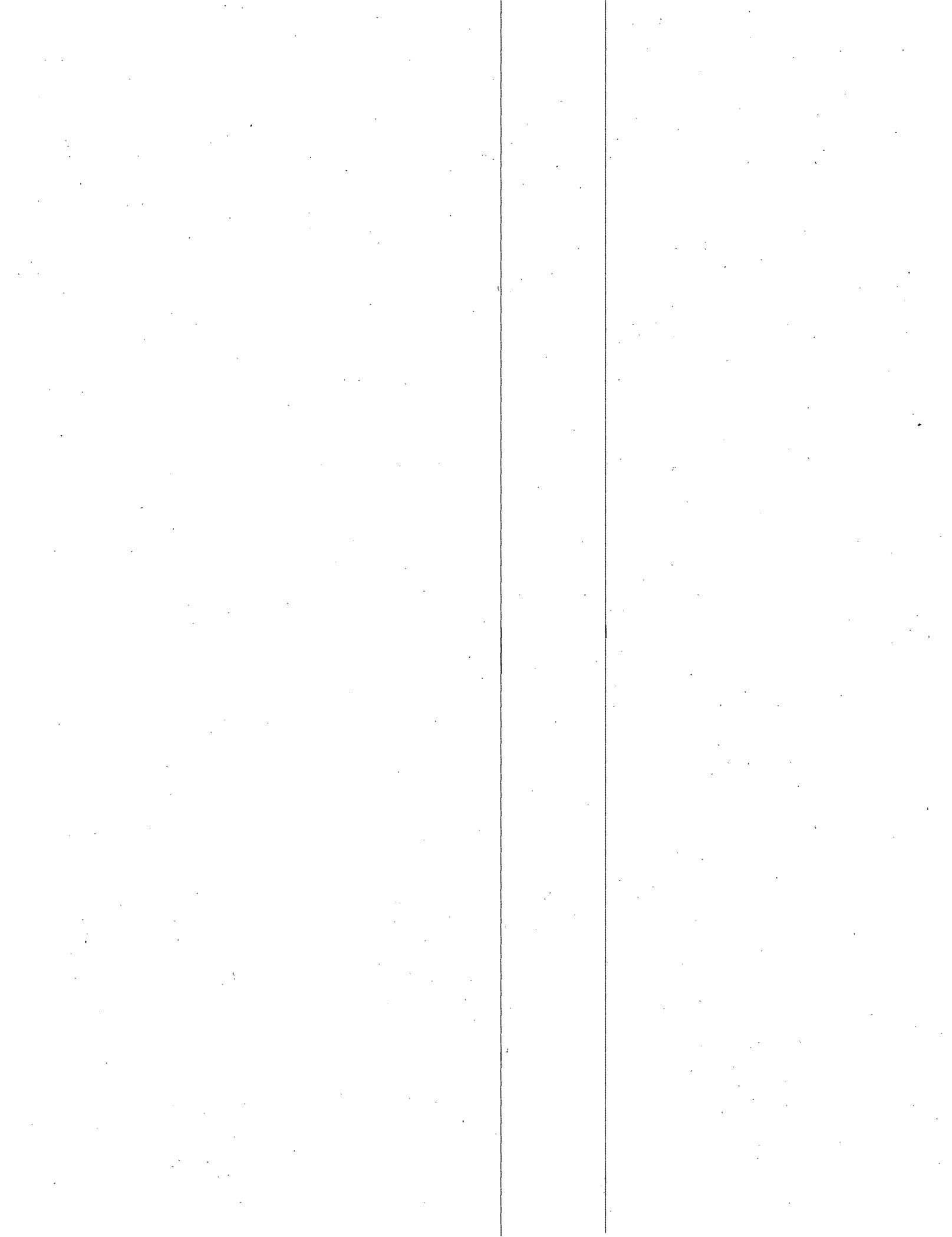
RW-12

WILLIAMS REFINING, L.L.C.

543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE

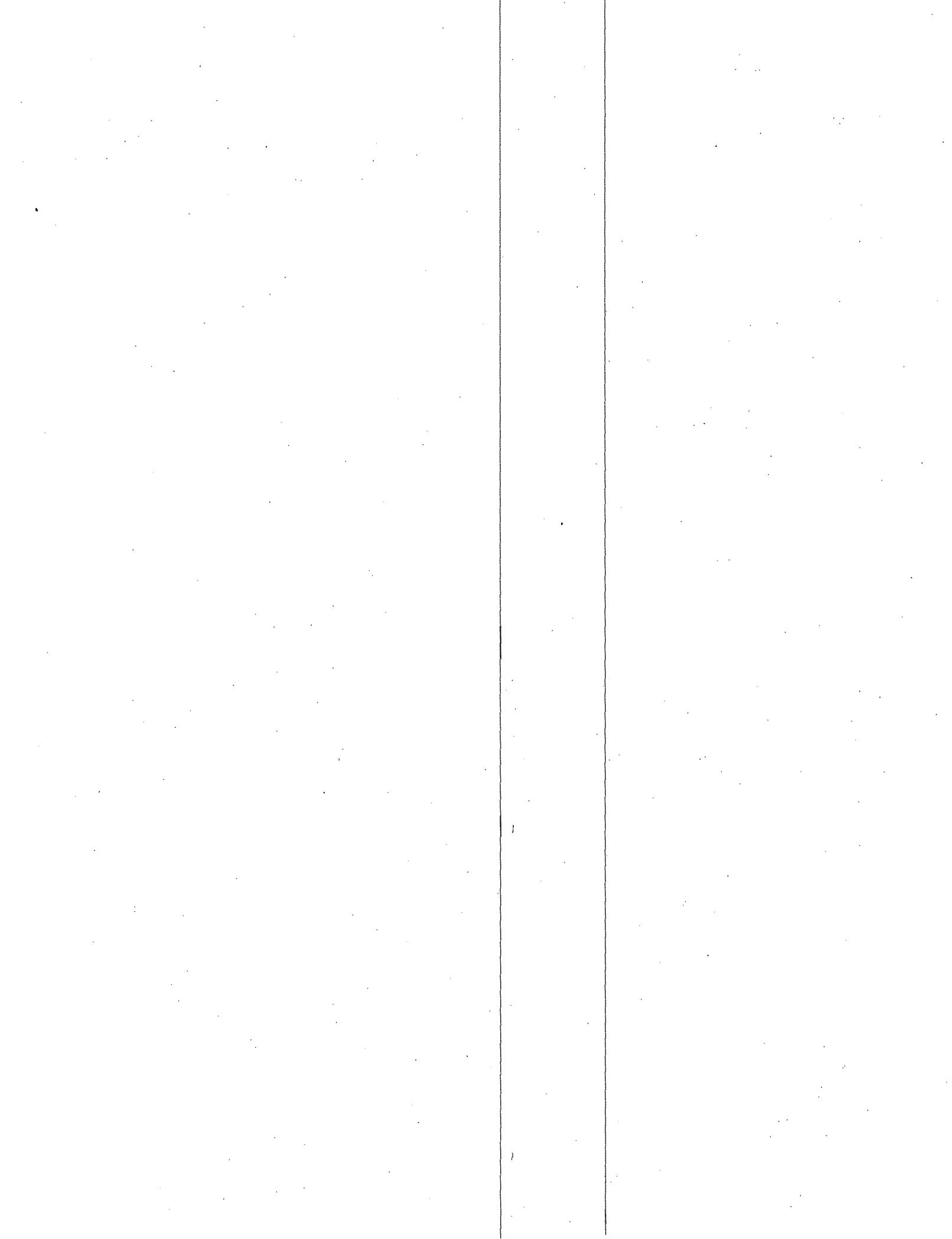
TDEC ID NO. 9-791214





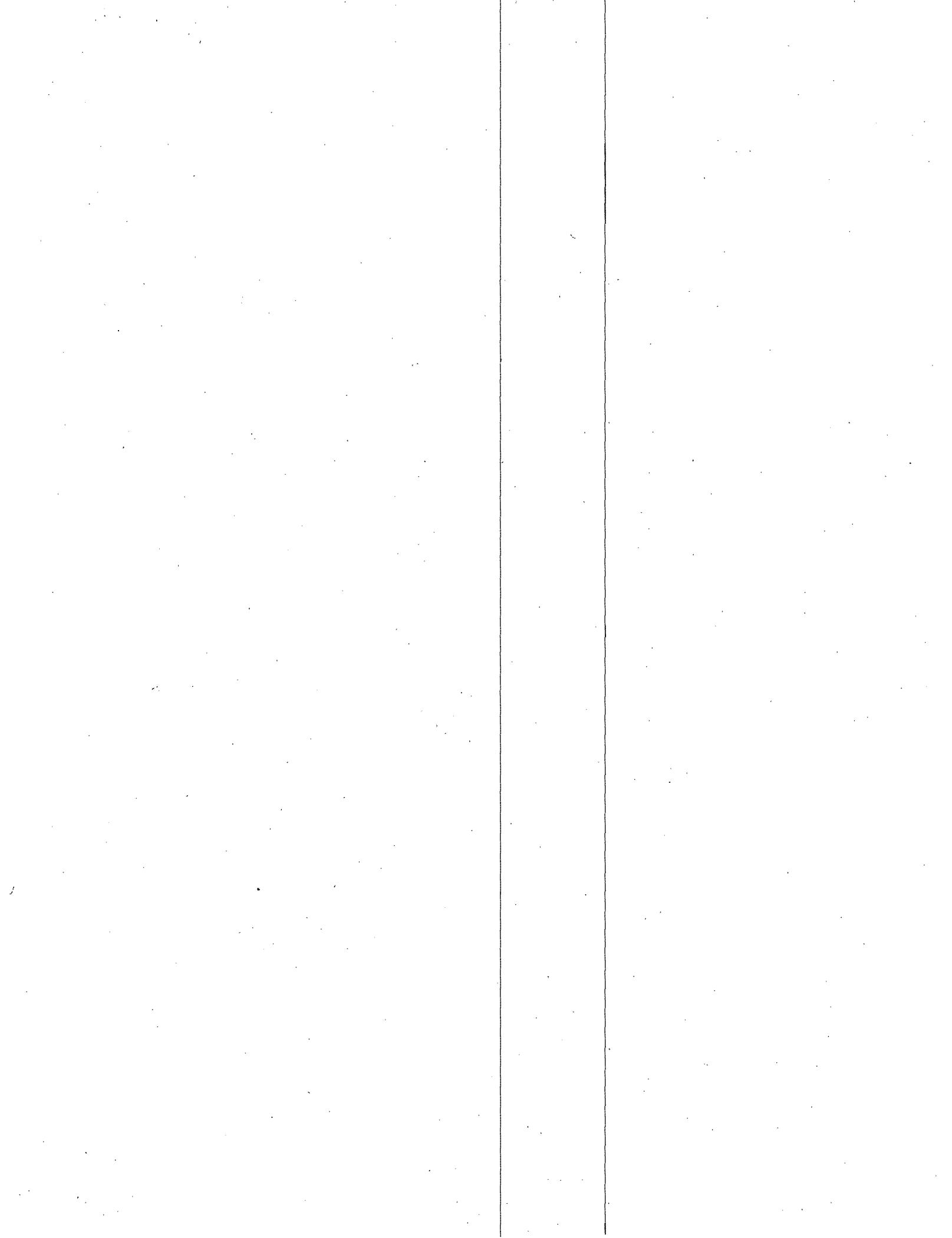
APPENDIX

E



APPENDIX E

HISTORICAL GROUNDWATER ELEVATIONS AND DISSOLVED CONSTITUENT CONCENTRATIONS AND GRAPHS



APPENDIX E
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:				PSH S.G.	0.80	Assumed	
	MW-1	Top of Casing Elevation not available	224.35	Depth to Screen not available				
Monitoring Date	Note	Measurements in Feet				Concentration listed in mg/L (ppm)		
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation	Benzene	GRO	DRO/EPH
07/28/95		ND	26.30	ND	198.05	ND	ND	ND
10/25/95		ND	34.18	ND	190.17	ND	ND	ND
04/02/96		ND	21.92	ND	202.43	ND	ND	ND
09/25/96		ND	32.63	ND	191.72	ND	ND	ND
04/01/97		ND	6.50	ND	217.85	ND	ND	ND
10/01/97		ND	34.32	ND	190.03	0.006	0.17	ND
02/12/98	1	ND	27.43	ND	196.92	ND	ND	0.18
03/04/98		ND	NG	ND	ND	ND	ND	ND
09/23/98		ND	33.90	ND	190.45	ND	ND	ND
03/30/99		ND	20.33	ND	204.02	ND	ND	0.1
06/30/99		ND	26.05	ND	198.30	ND	ND	ND
09/27/99	2	ND	36.71	ND	187.64	0.0047	ND	0.34

Notes:

PSH = Phase separated hydrocarbons

ND = Not detected NA = Not analyzed

NG = Not gauged

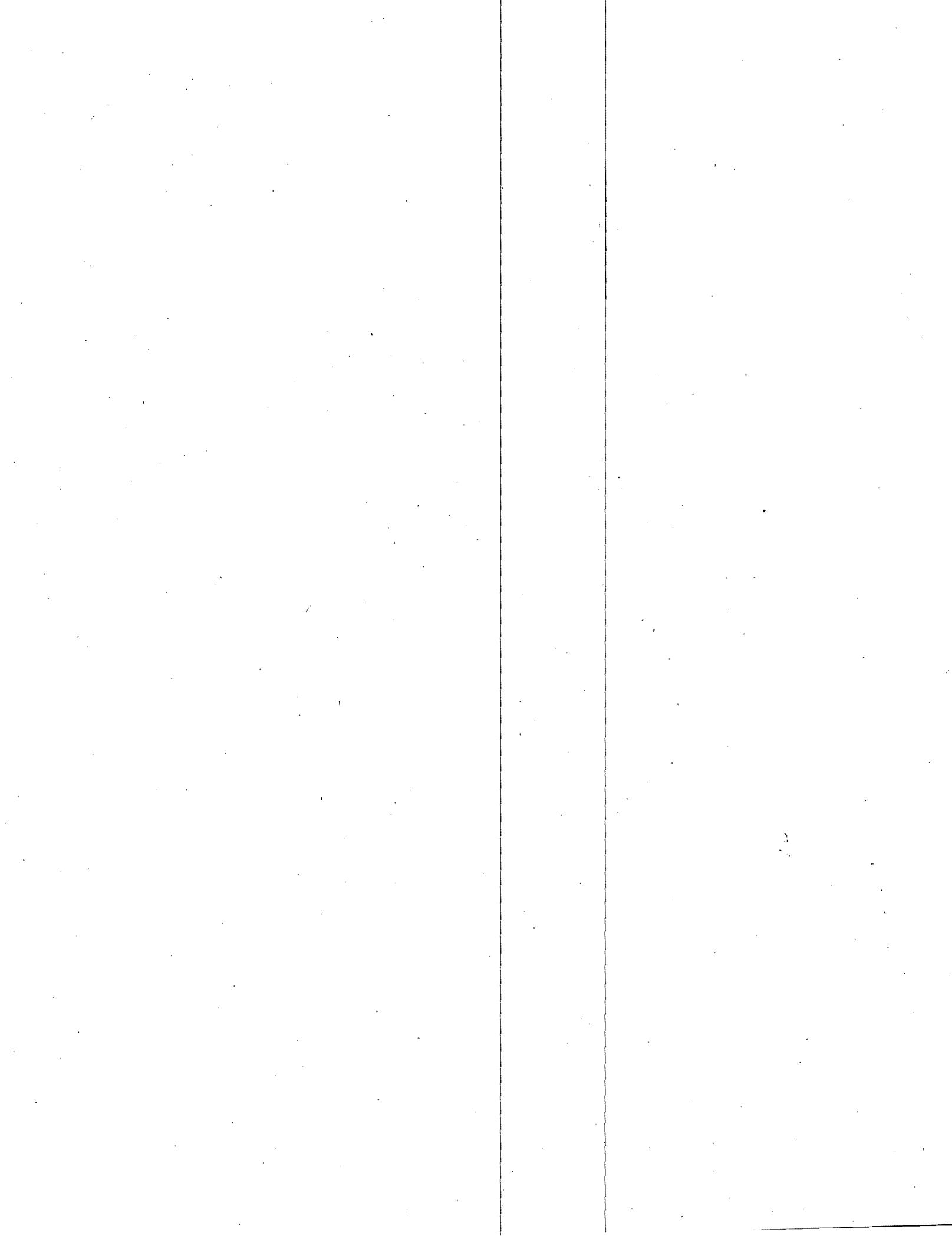
NS = Not sampled

Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

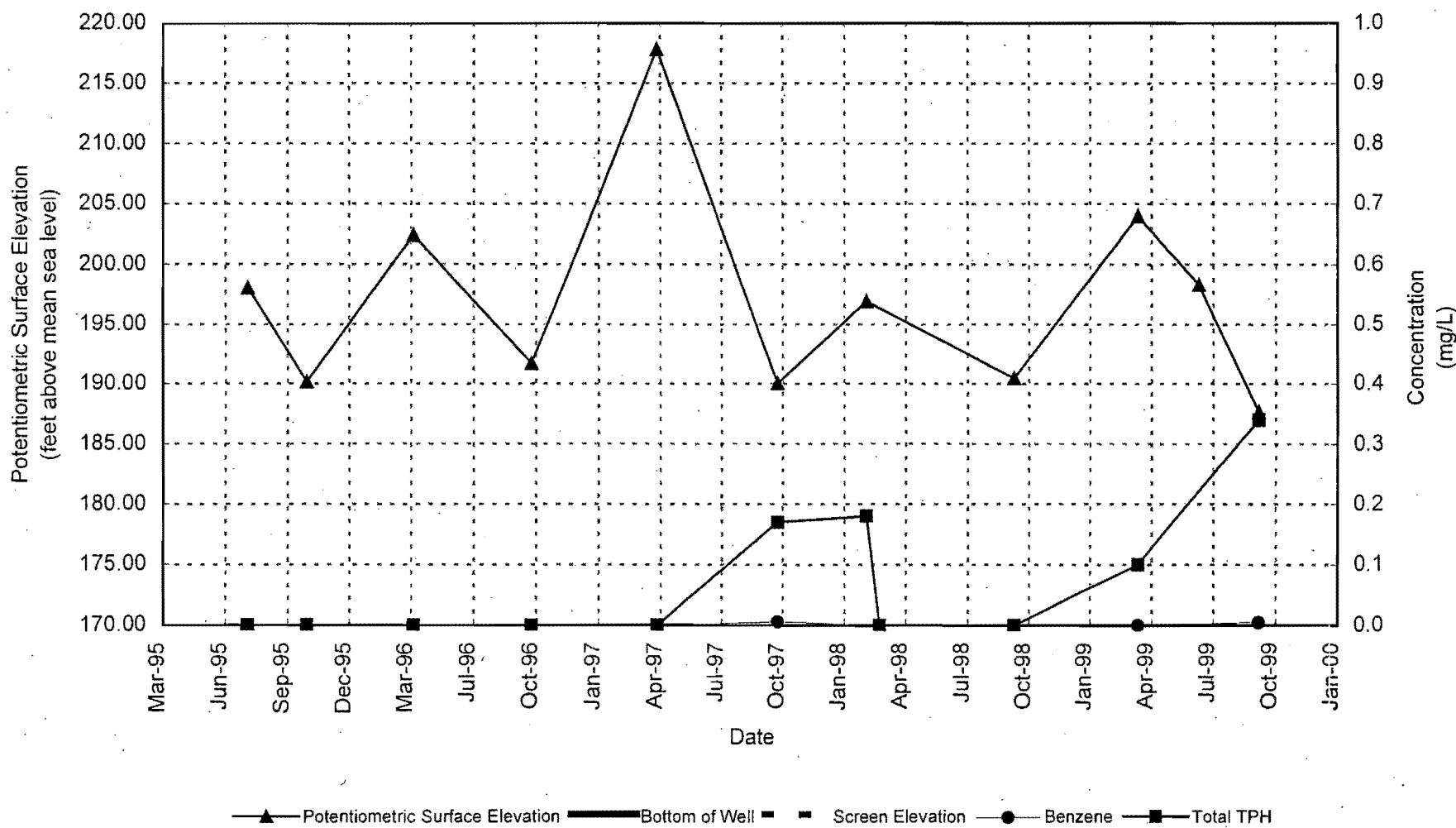
$$\text{Potentiometric Surface Elevation} = \text{Top of Casing Elevation} - \text{Depth to Water} + (\text{Specific Gravity of PSH} \times \text{PSH Thickness})$$

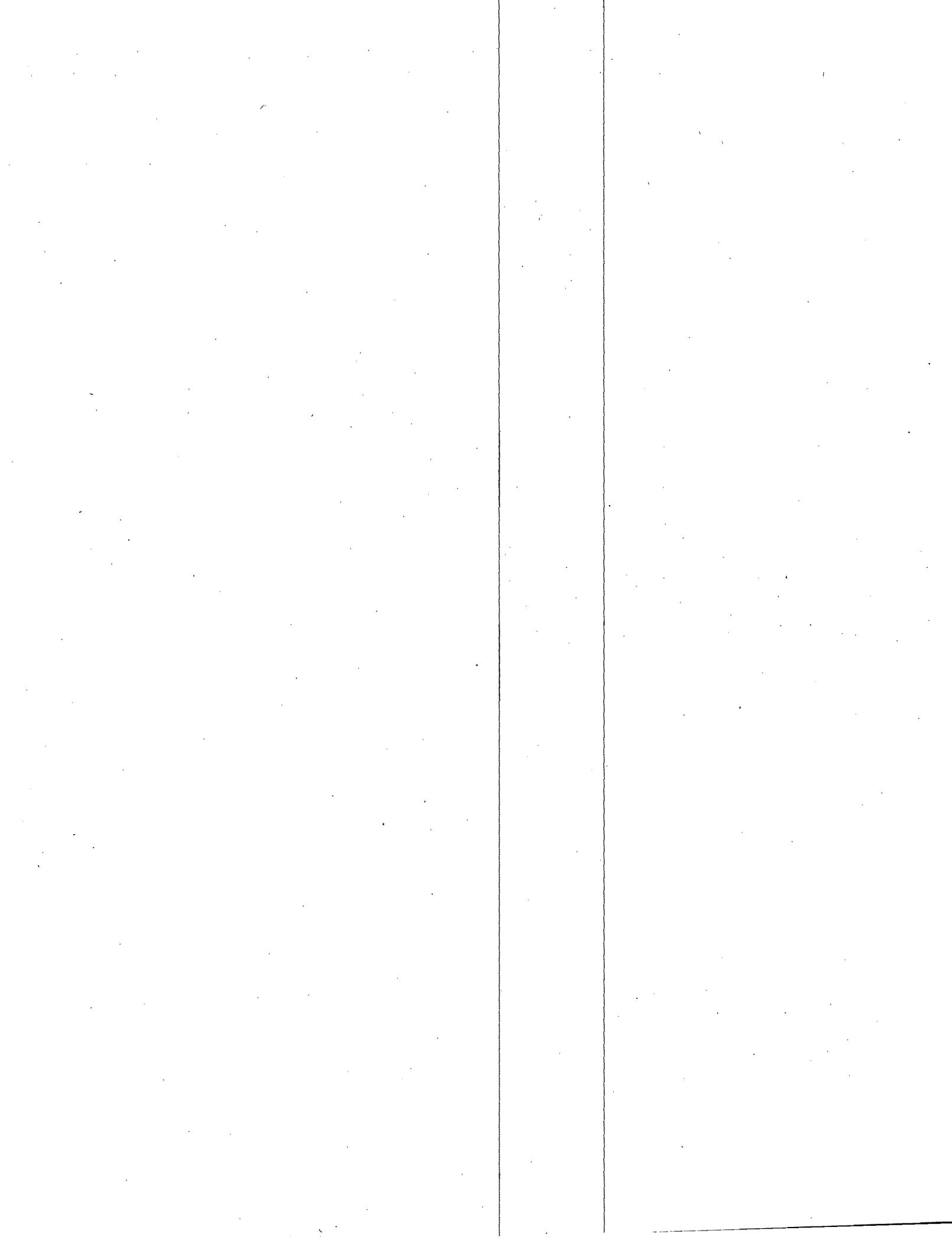
1] Laboratory holding time exceeded for BTEX - resampled on 3/4/98

2] Sample aliquots for EPH analysis compromised at lab - re-sampled for EPH analysis on 10/13/99



MONITORING DATA VS. TIME
MW-1
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE
TDEC ID NO. 9-791214





APPENDIX E
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:				PSH S.G.	0.80	Assumed	
	Top of Casing Elevation	227.77	Depth to Screen	25.00				
OW-6	Well Depth	45.00						
Measurements in Feet								
Monitoring Date	Note	Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation	Benzene	GRO	DRO/EPH
07/29/95		ND	28.52	ND	199.25	ND	ND	0.48
10/25/95		ND	33.38	ND	194.39	ND	ND	2.4
04/02/96		ND	22.52	ND	205.25	ND	ND	ND
09/25/96		ND	31.70	ND	196.07	ND	ND	0.14
04/01/97		ND	2.37	ND	225.40	ND	ND	ND
10/01/97		ND	31.45	ND	196.32	ND	0.14	0.755
02/12/98	1	ND	26.61	ND	201.16	ND	ND	0.11
03/04/98		ND	NG	ND	ND	ND	ND	ND
09/25/98		ND	31.32	ND	196.45	ND	ND	ND
03/30/99		ND	20.28	ND	207.49	ND	ND	0.34
06/30/99		ND	26.98	ND	200.79	ND	ND	ND
09/27/99		ND	33.43	ND	194.34	ND	0.2	2.79

Notes:

PSH = Phase separated hydrocarbons

ND = Not detected

NA = Not analyzed

NG = Not gauged

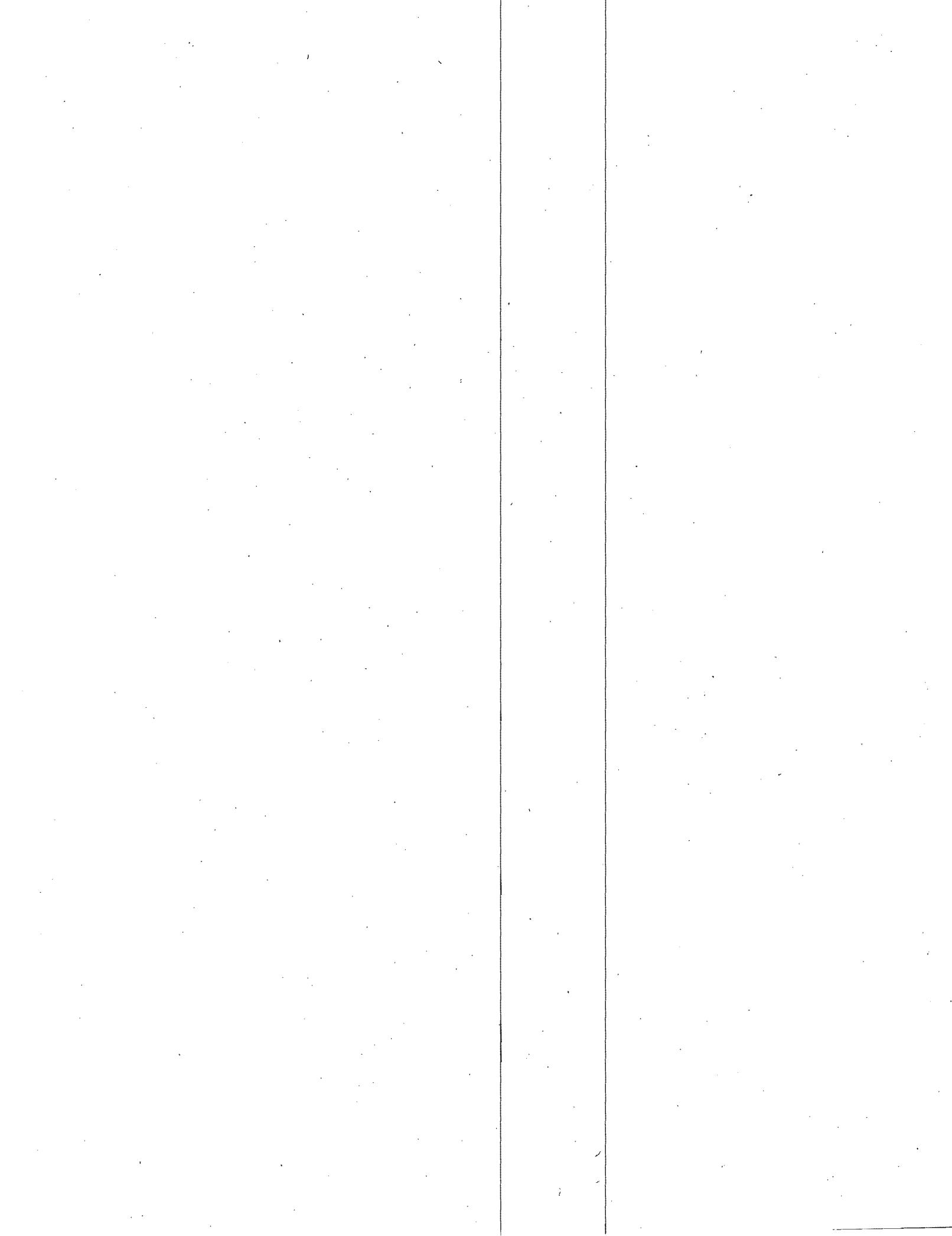
NS = Not sampled

Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

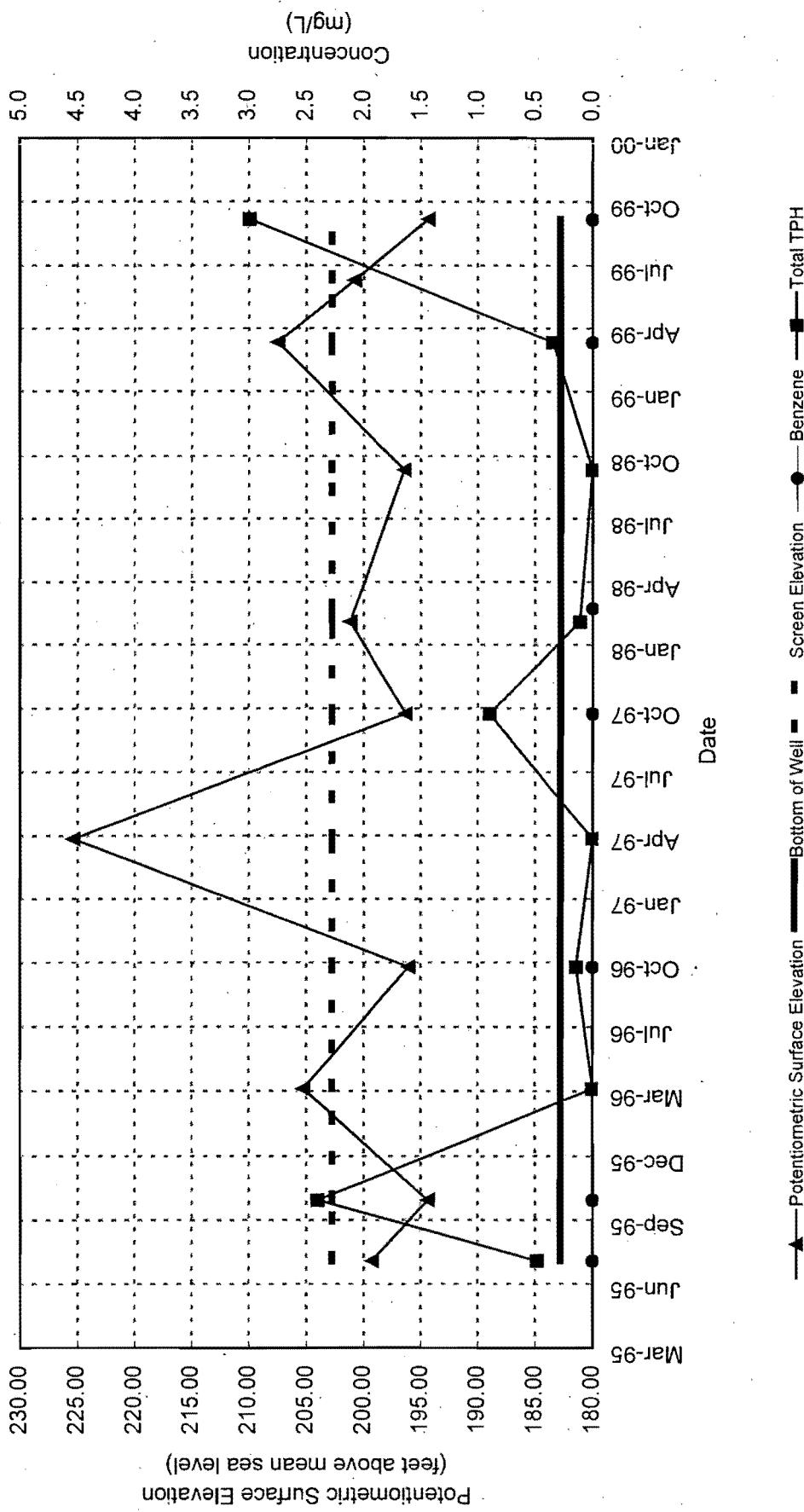
$$\text{Potentiometric Surface Elevation} = \text{Top of Casing Elevation} - \text{Depth to Water} + (\text{Specific Gravity of PSH} \times \text{PSH Thickness})$$

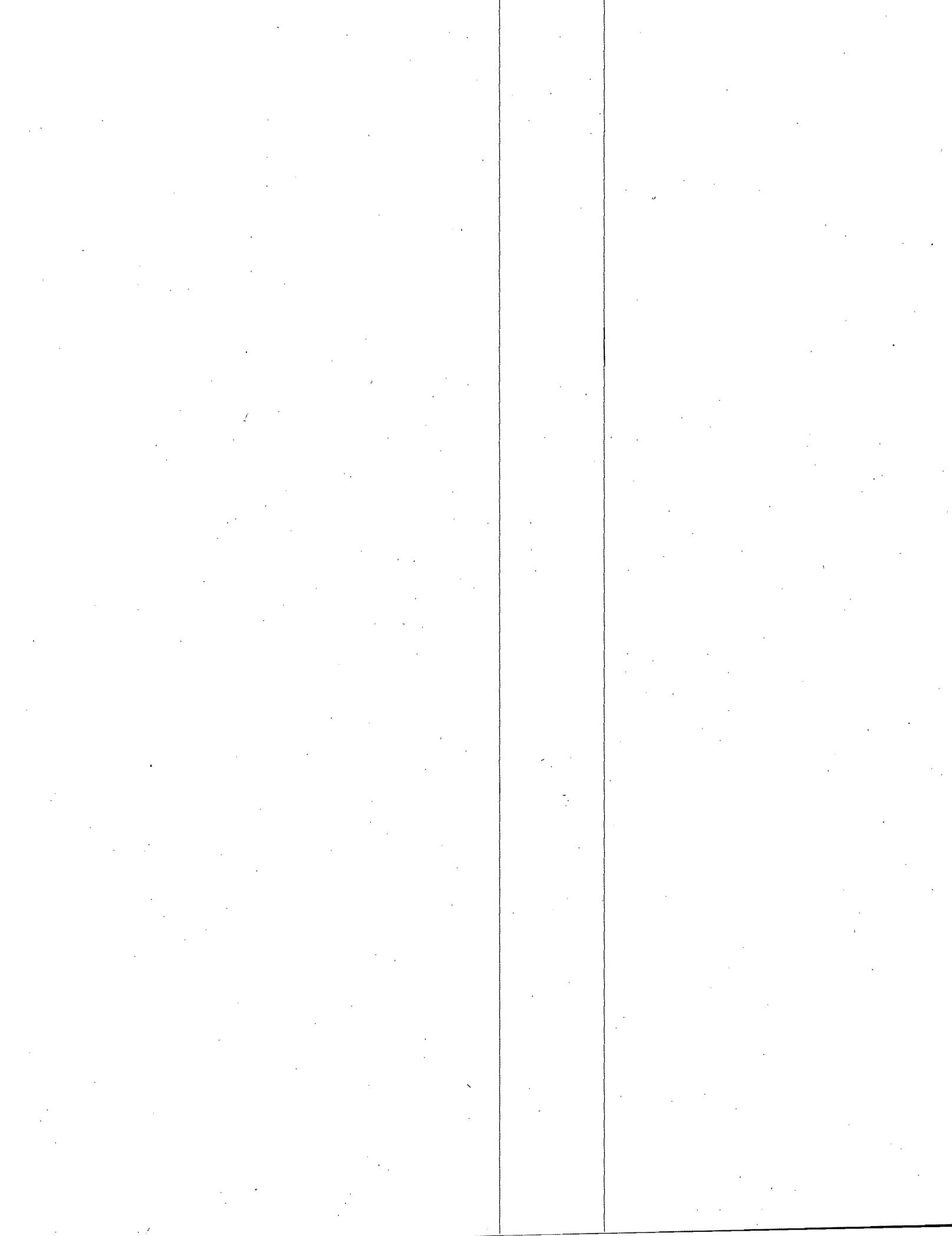
1] Laboratory holding time exceeded for BTEX - resampled on 3/4/98

2] Sample aliquots for EPH analysis compromised at lab - re-sampled for EPH analysis on 10/13/99



MONITORING DATA VS. TIME
OW-6
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE
TDEC ID NO. 9-791214





APPENDIX E
HISTORICAL MONITORING DATA

WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:		Construction:			PSH S.G.	0.60	Assumed	
Monitoring Date	Note	Measurements in Feet				Concentration listed in mg/L (ppm)		
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation	Benzene	GRO	DRO/EPH
07/30/95		ND	20.88	ND	203.23	0.007	0.08	ND
10/25/95		ND	25.11	ND	199.00	ND	3.0	ND
04/02/96		ND	22.98	ND	201.13	ND	ND	ND
09/25/96		ND	23.59	ND	200.52	ND	ND	0.17
04/01/97		ND	12.79	ND	211.32	ND	ND	ND
10/01/97		ND	21.77	ND	202.34	ND	ND	ND
02/12/98	1	ND	22.00	ND	202.11	ND	ND	0.13
03/04/98		ND	NG	ND	ND	ND	ND	ND
09/24/98		ND	20.89	ND	203.22	ND	ND	ND
03/30/99		ND	17.80	ND	206.31	ND	ND	0.1
06/30/99		ND	19.39	ND	204.72	ND	ND	ND
09/27/99		ND	24.55	ND	199.56	0.0038	ND	0.19

Notes:

PSH = Phase separated hydrocarbons

ND = Not detected NA = Not analyzed

NG = Not gauged

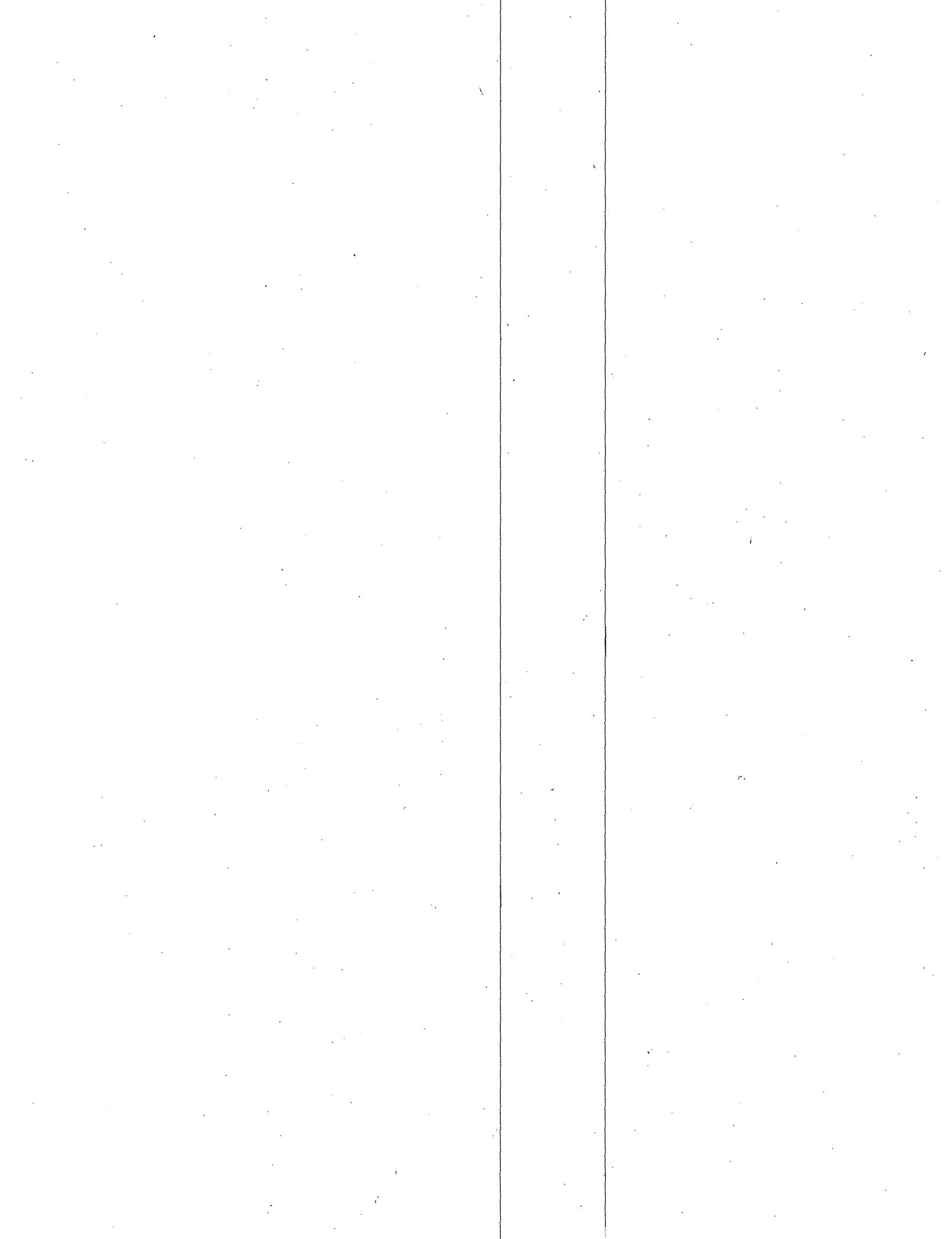
NS = Not sampled

Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

Potentiometric Surface Elevation = Top of Casing Elevation - Depth to Water + (Specific Gravity of PSH x PSH Thickness)

1] Laboratory holding time exceeded for BTEX - resampled on 3/4/98

2] Sample aliquots for EPH analysis compromised at lab - re-sampled for EPH analysis on 10/13/99

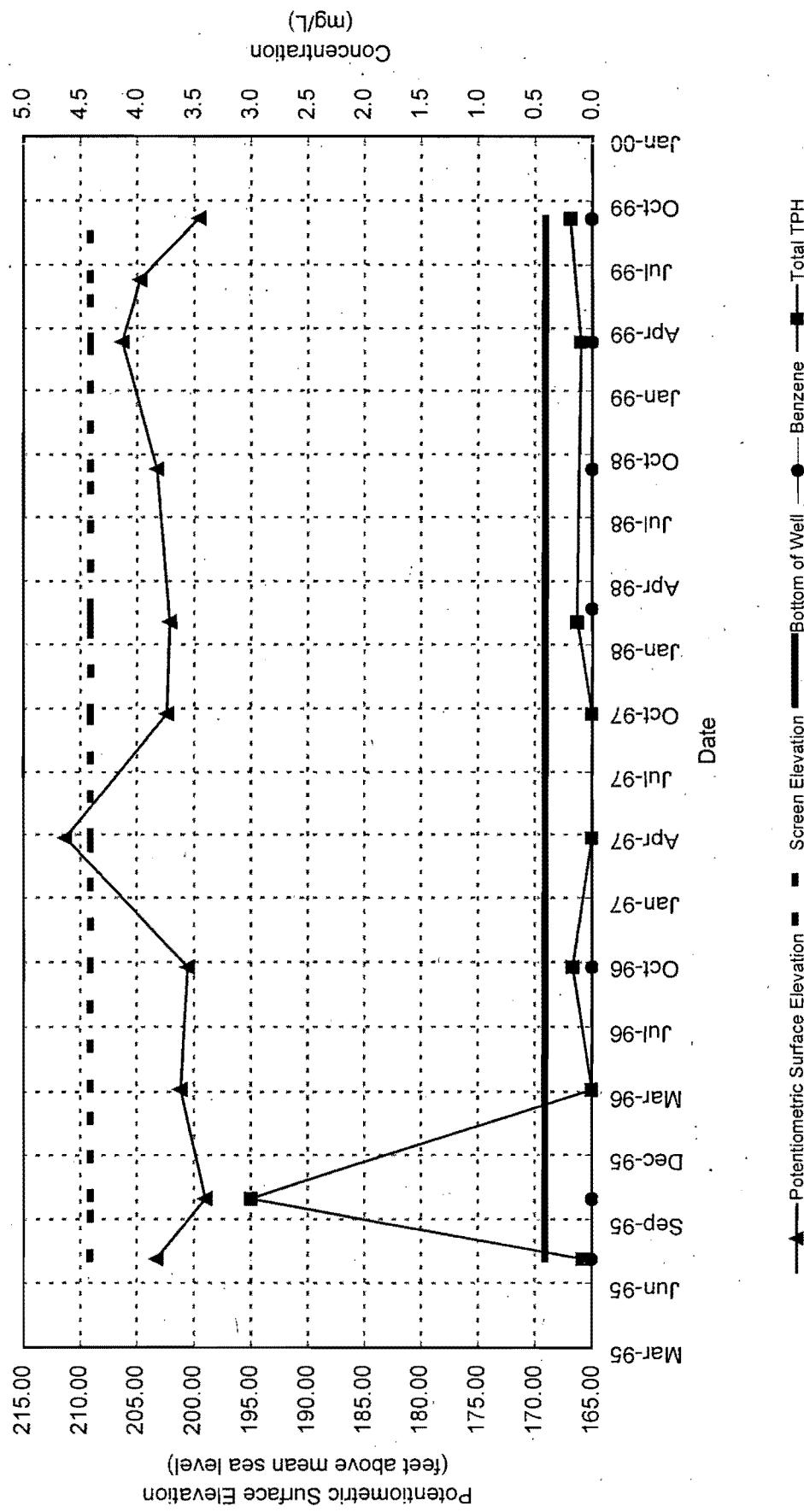


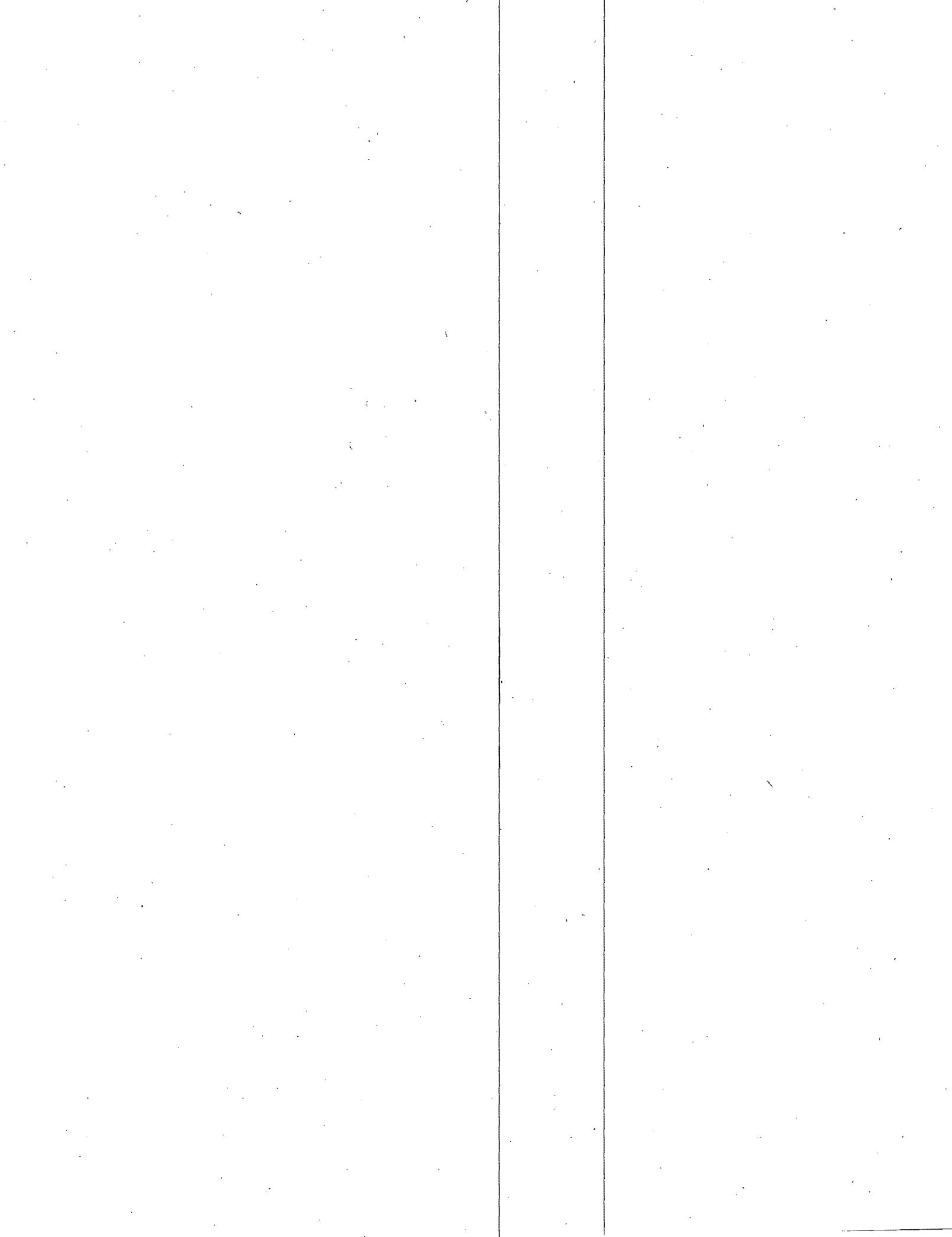
MONITORING DATA VS. TIME

OW-15

WILLIAMS REFINING, L.L.C.

543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE
TDEC ID NO. 9-791214



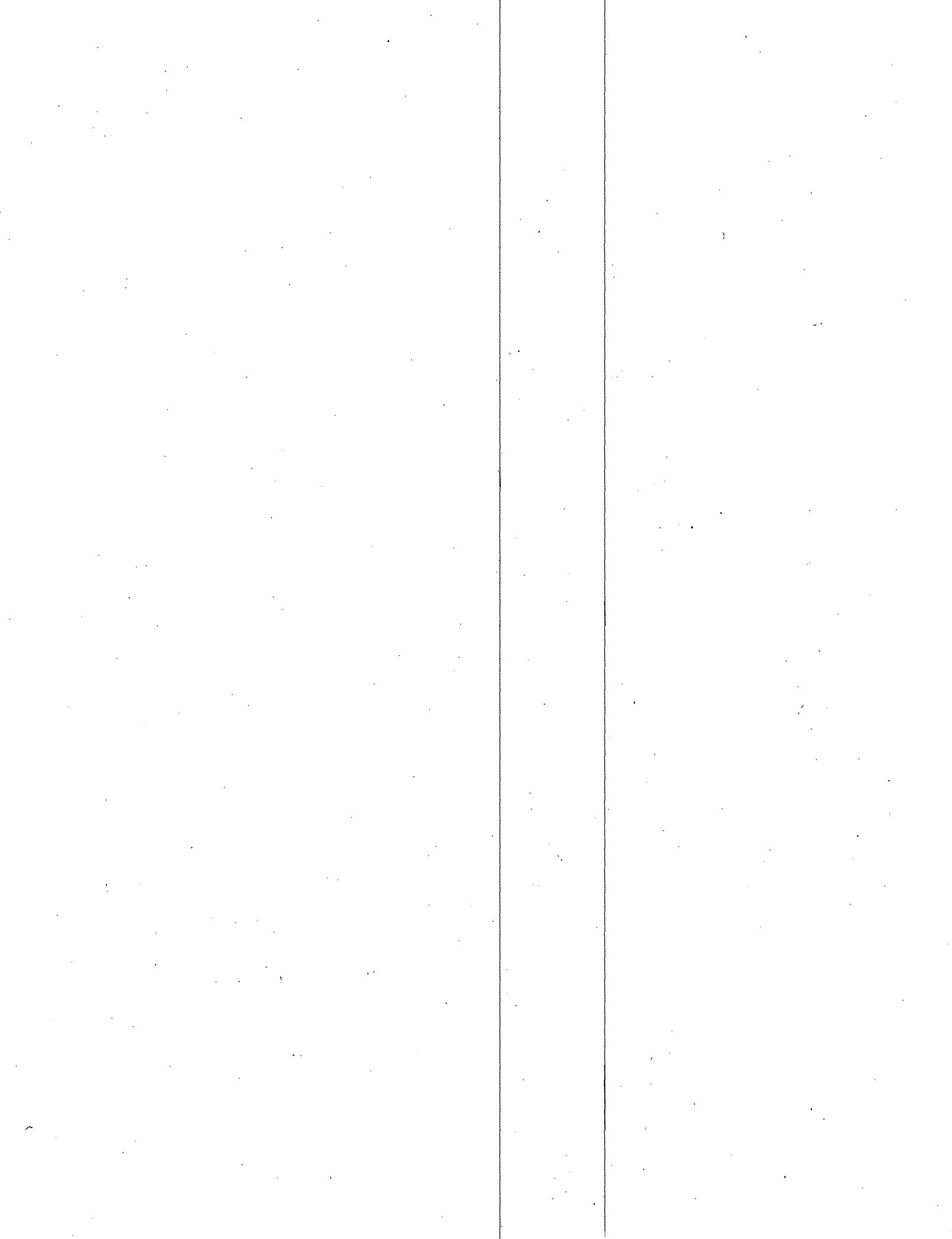


APPENDIX E
HISTORICAL MONITORING DATA

WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:	Construction:					PSH S.G.	0.80	Assumed ✓
	Top of Casing Elevation	217.48	Depth to Screen	10.00	Well Depth			
Monitoring Date	Note	Measurements in Feet				Concentration listed in mg/L (ppm)		
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation	Benzene	GRO	DRO/EPH
07/28/95		ND	9.89	ND	207.59	NS	NS	NS
10/25/95		ND	8.13	ND	209.35	NS	NS	NS
04/02/96		ND	9.57	ND	207.91	NS	NS	NS
09/25/96		ND	13.10	ND	204.38	NS	NS	NS
04/01/97		ND	5.15	ND	212.33	ND	0.0107	ND
10/01/97		ND	19.57	ND	197.91	ND	0.4	0.496
02/12/98	1	ND	10.33	ND	207.15	ND	ND	0.39
03/04/98		ND	NG	ND	ND	ND	ND	ND
09/25/98		ND	12.05	ND	205.43	ND	ND	ND
03/30/99		ND	7.67	ND	209.81	ND	ND	1.52
06/30/99		ND	10.82	ND	206.66	ND	ND	ND
09/27/99		ND	14.97	ND	202.51	ND	ND	ND

Notes:
PSH = Phase separated hydrocarbons
ND = Not detected NA = Not analyzed NG = Not gauged NS = Not sampled
Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:
Potentiometric Surface Elevation = Top of Casing Elevation - Depth to Water + (Specific Gravity of PSH x PSH Thickness)
1] Laboratory holding time exceeded for BTEX - resampled on 3/4/98
2] Sample aliquots for EPH analysis compromised at lab - re-sampled for EPH analysis on 10/13/99



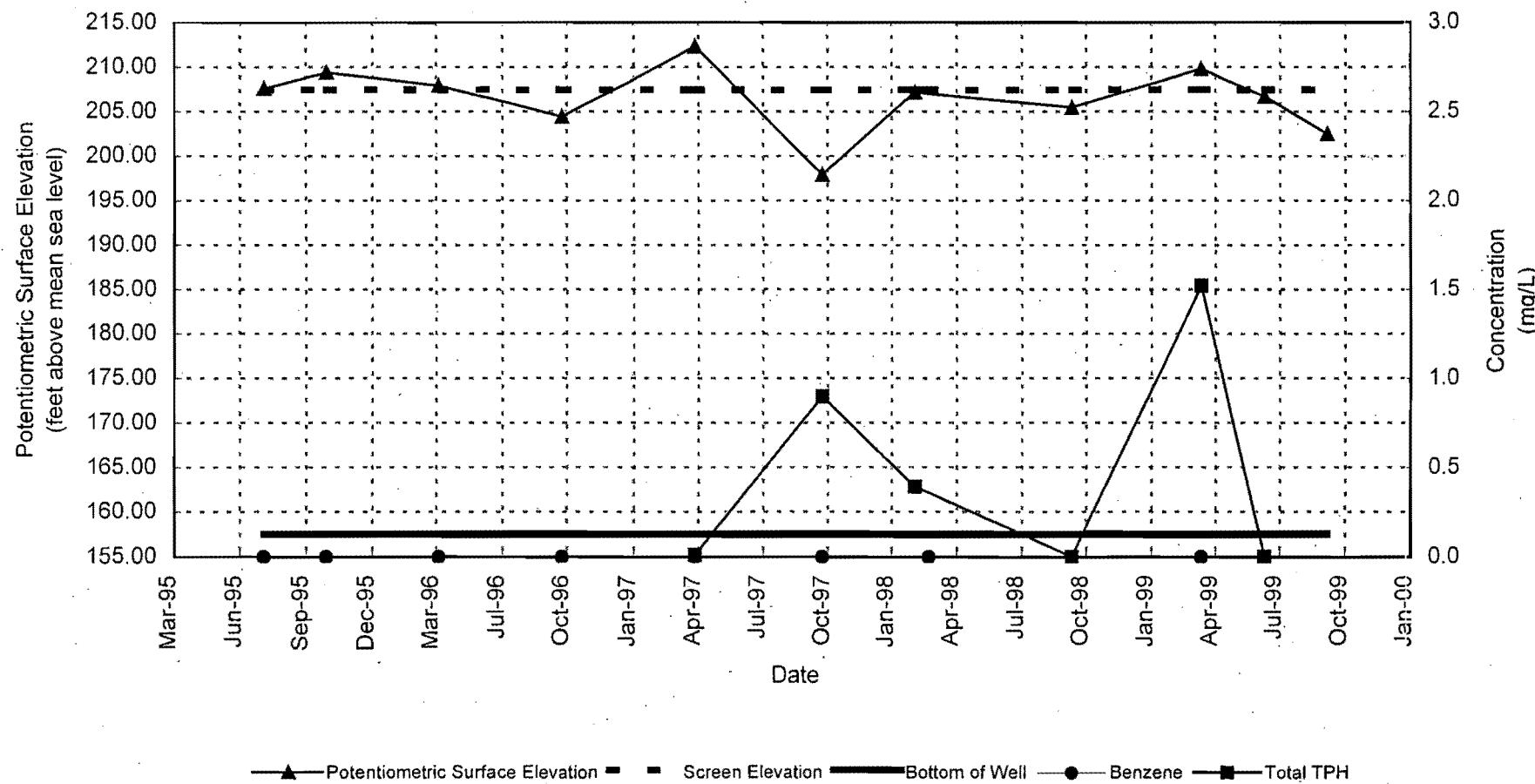
MONITORING DATA VS. TIME

OW-26

WILLIAMS REFINING, L.L.C.

543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE

TDEC ID NO. 9-791214



APPENDIX E
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:		Construction:			PSH S.G.	0.80	Assumed	
OW-29		Measurements in Feet			Concentration listed in mg/L (ppm)			
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation	Benzene	GRO	DRO/EPH
07/28/95		ND	14.14	ND	216.92	0.523	5.73	1.91
10/25/95		ND	DRY	ND		NS	NS	NS
04/02/96		ND	14.16	ND	216.90	ND	ND	ND
09/25/96		ND	15.23	ND	215.83	ND	ND	0.34
04/01/97		ND	8.97	ND	222.09	ND	ND	ND
10/01/97		ND	16.40	ND	214.66	0.012		0.494
02/12/98	1	ND	19.10	ND	211.96		ND	1.63
03/04/98		ND	NG	ND		ND		
09/24/98		ND	16.08	ND	214.98	ND	ND	0.5
03/30/99		ND	33.00	ND	198.06			
06/30/99		ND	32.90	ND	198.16			
09/27/99	2,3	ND	49.09	ND	183.91	0.001	ND	0.46

Notes:

PSH = Phase separated hydrocarbons

ND = Not detected

NA = Not analyzed

NG = Not gauged

NS = Not sampled

Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

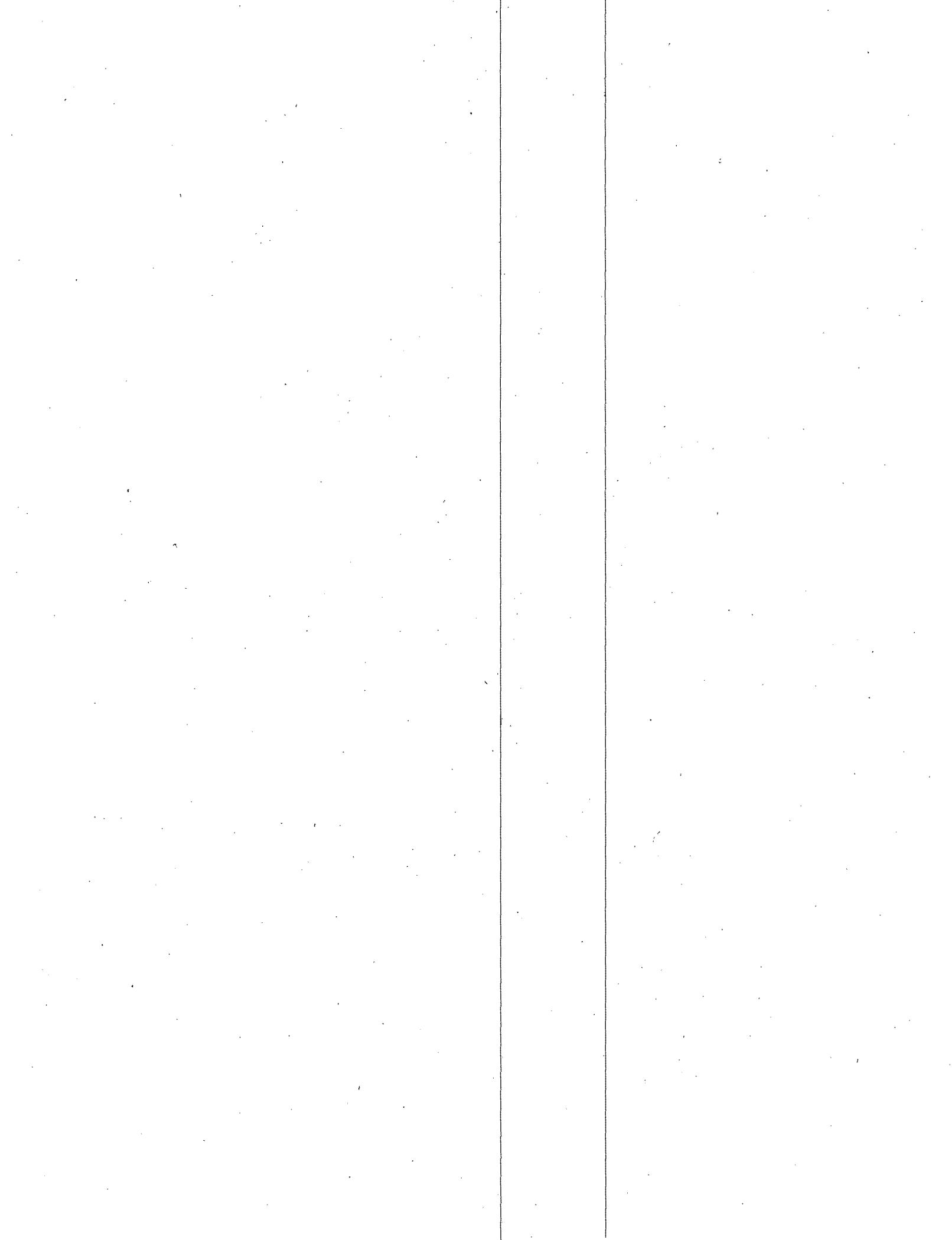
Potentiometric Surface Elevation = Top of Casing Elevation - Depth to Water + (Specific Gravity of PSH x PSH Thickness)

1] Laboratory holding time exceeded for BTTEX - resampled on 3/4/98

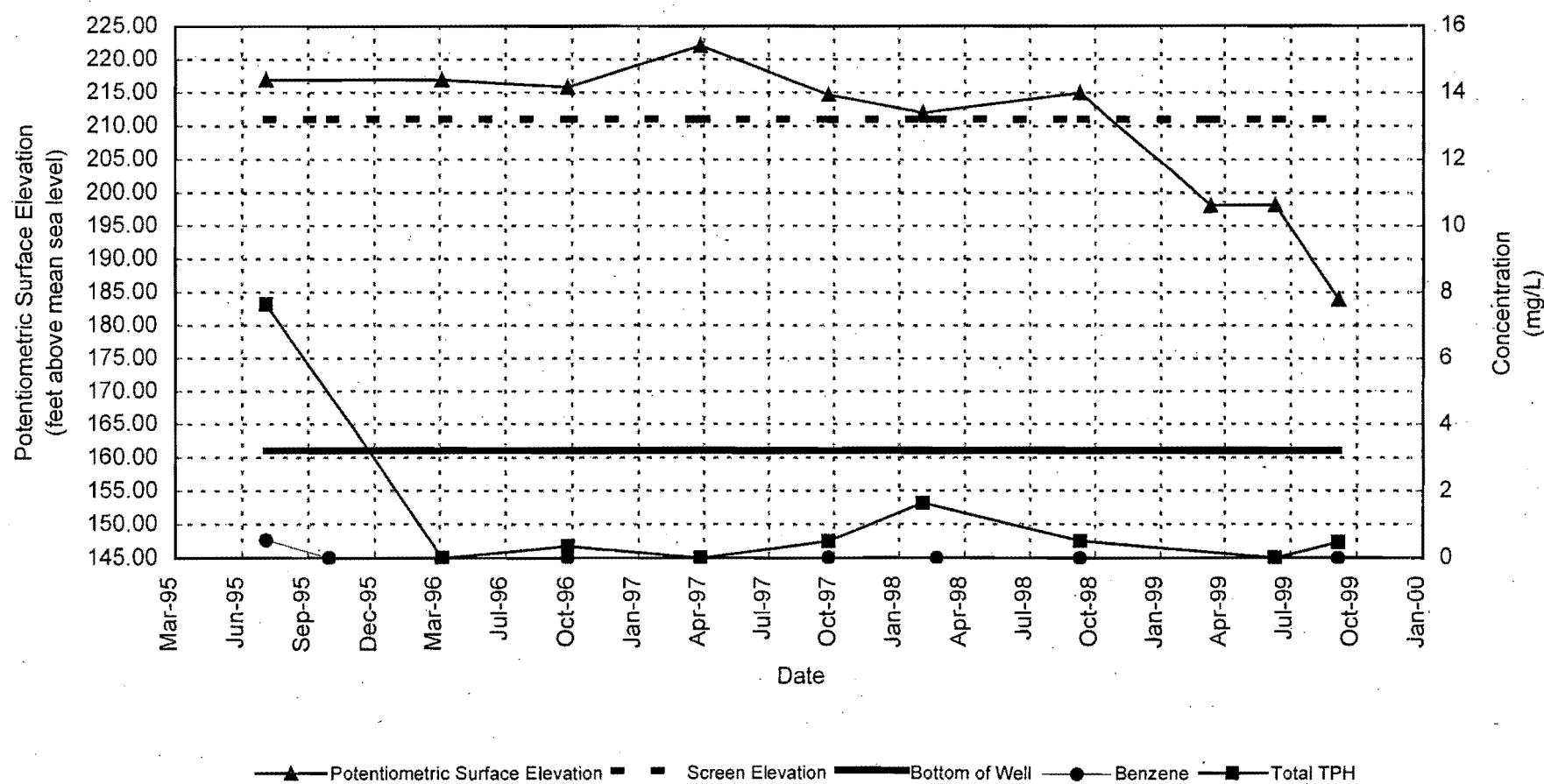
2] Sample aliquots for EPH analysis compromised at lab - re-sampled for EPH analysis on 10/13/99

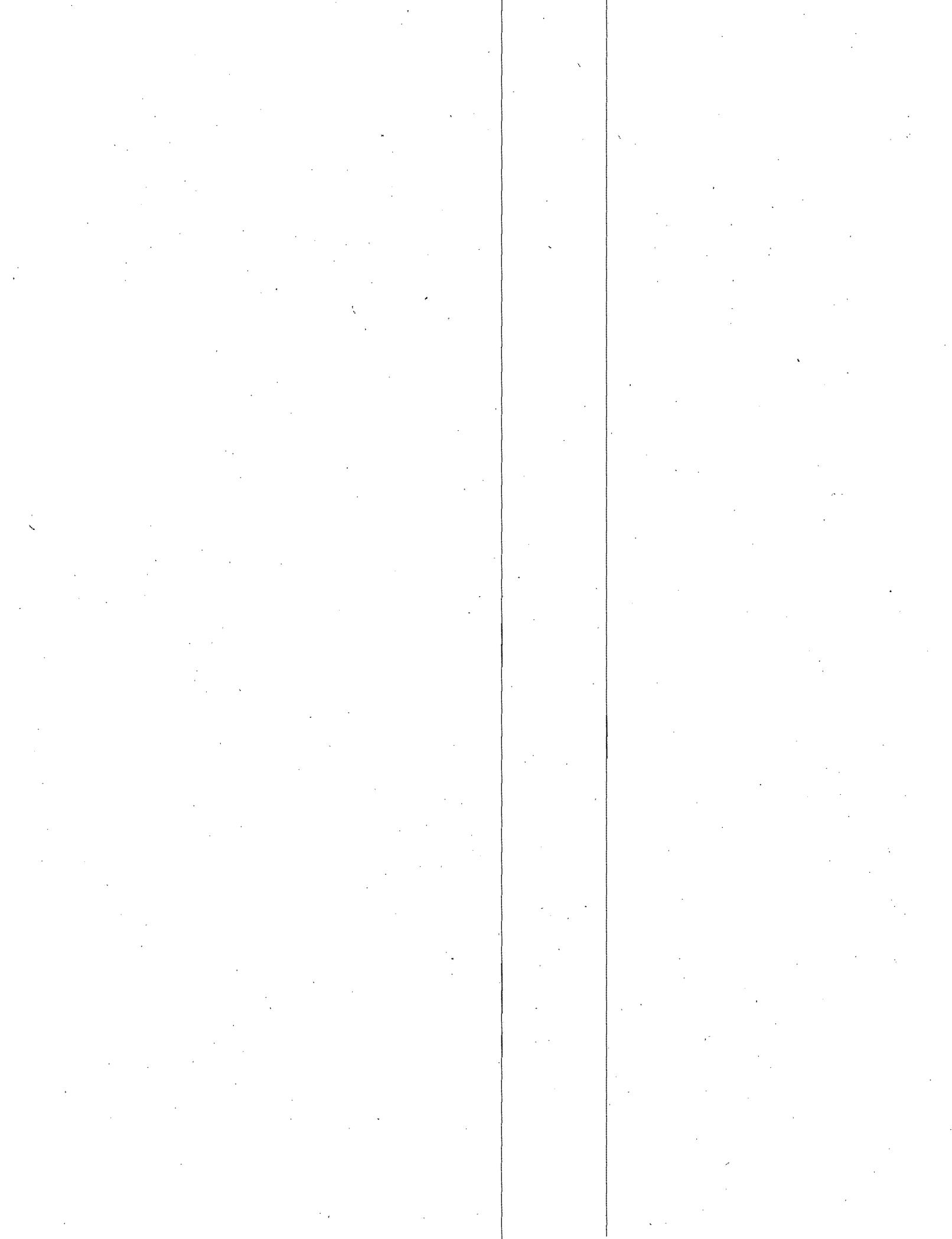
3] OW-29 was abandoned prior to gauging and sampling - Data presented is from OW-29[R], which was installed adjacent to OW-29

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MONITORING DATA VS. TIME
OW-29
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE
TDEC ID NO. 9-791214





APPENDIX E
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:		Construction:			PSH S.G.	0.80	Assumed	
0W-30		Top of Casing Elevation	235.28	Depth to Screen	20.00	Well Depth	70.00	
Monitoring Date	Note	Measurements in Feet				Concentration listed in mg/L (ppm)		
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation	Benzene	GRO	DRO/EPH
07/28/95		ND	44.25	ND	191.03	ND	ND	ND
10/25/95		ND	49.16	ND	186.12	0.01	ND	ND
04/02/96		ND	33.93	ND	201.35	ND	ND	ND
09/25/96		ND	48.44	ND	186.84	0.034	0.21	0.21
04/01/97		ND	20.37	ND	214.91	ND	ND	ND
10/01/97		ND	27.10	ND	208.18			
02/12/98		ND	DRY	ND				
09/24/98		ND	DRY	ND				
03/30/99		ND	36.10	ND	199.18	0.0433	ND	1.12
06/30/99		ND	41.65	ND	193.63			
09/27/99	1	ND	51.91	ND	183.37	ND	ND	0.31

Notes:

PSH = Phase separated hydrocarbons

ND = Not detected NA = Not analyzed

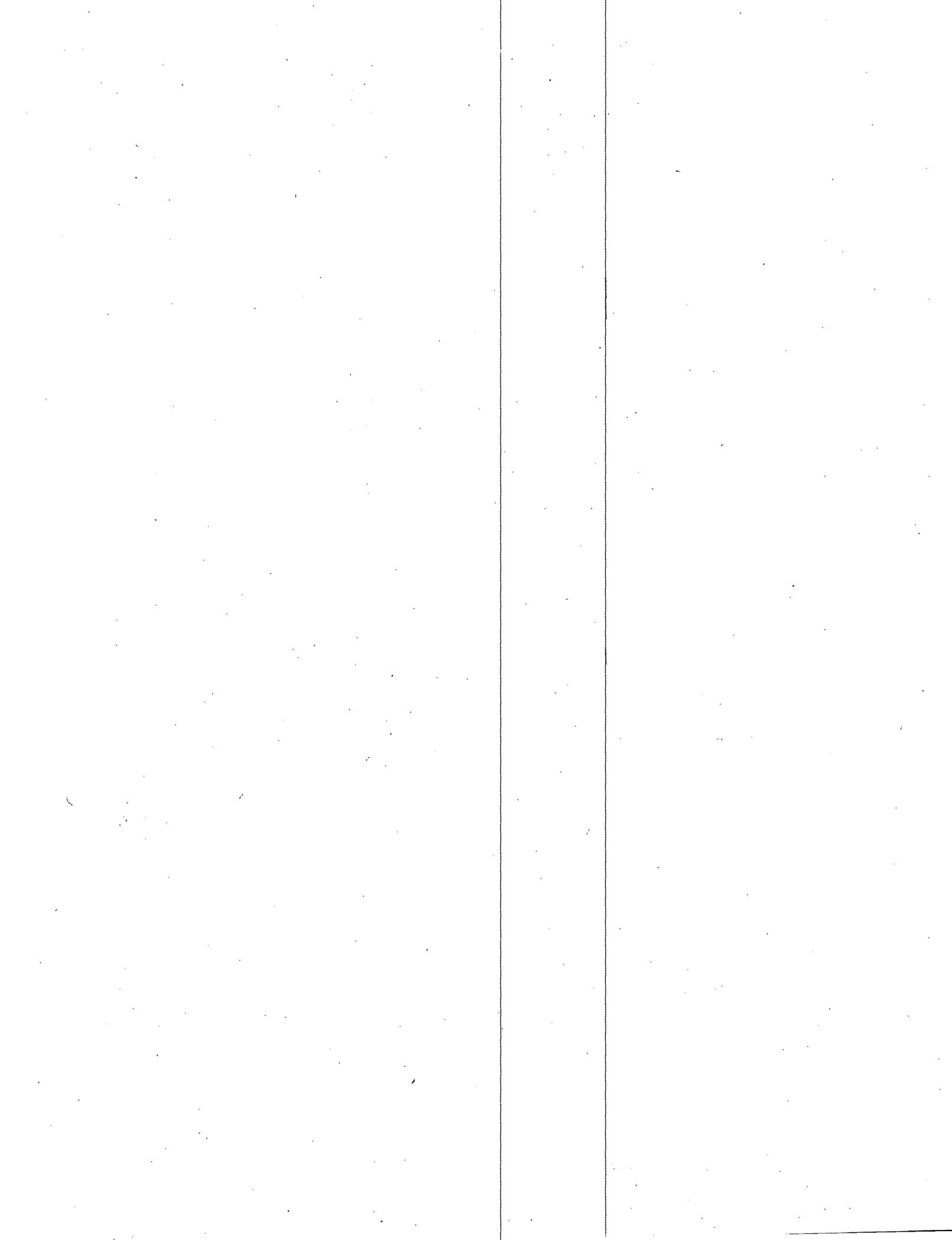
NG = Not gauged

NS = Not sampled

Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

Potentiometric Surface Elevation = Top of Casing Elevation - Depth to Water + (Specific Gravity of PSH x PSH Thickness)

[1] Sample aliquots for EPH analysis compromised at lab - re-sampled for EPH analysis on 10/13/99



MONITORING DATA VS. TIME

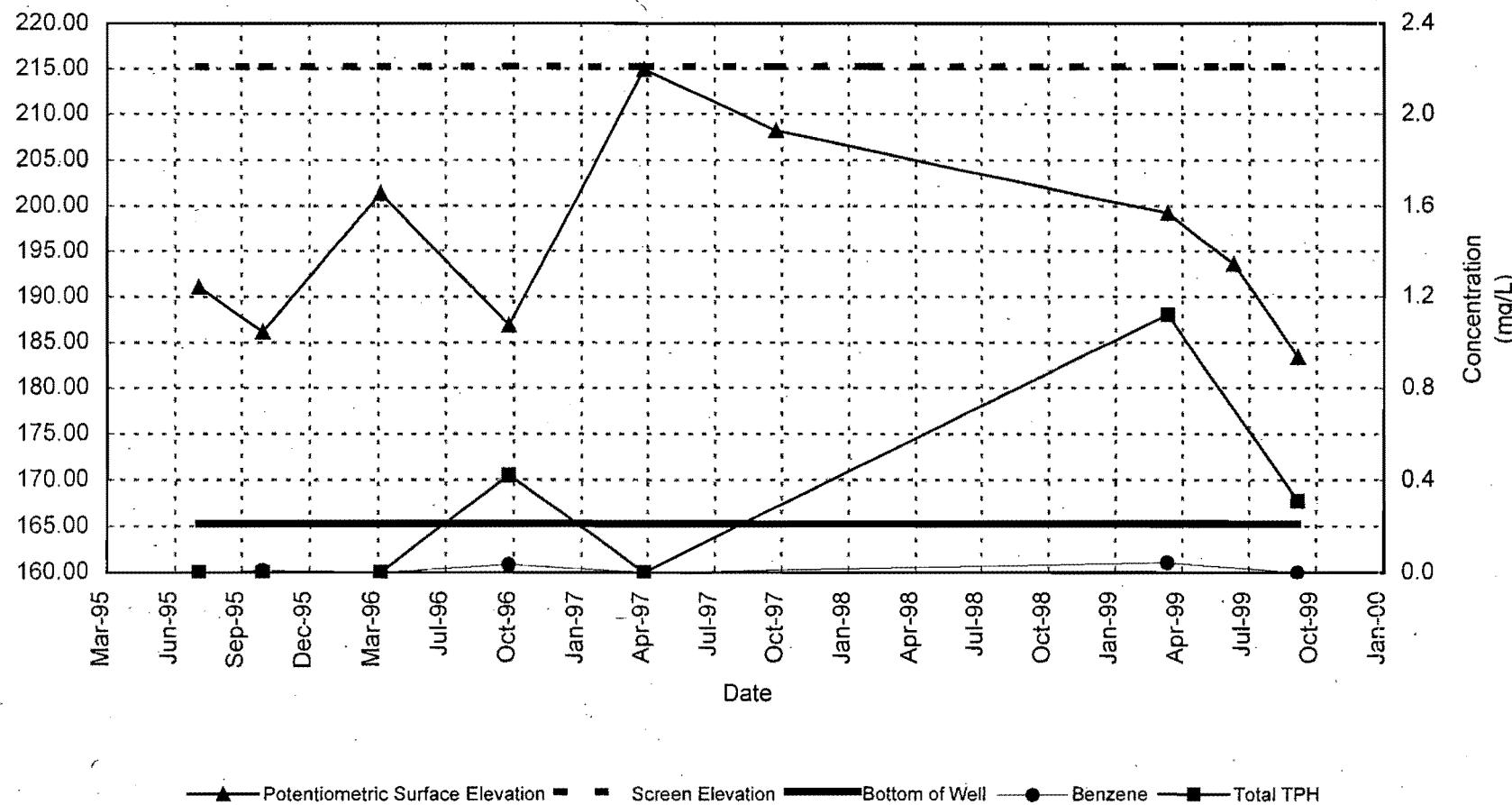
OW-30

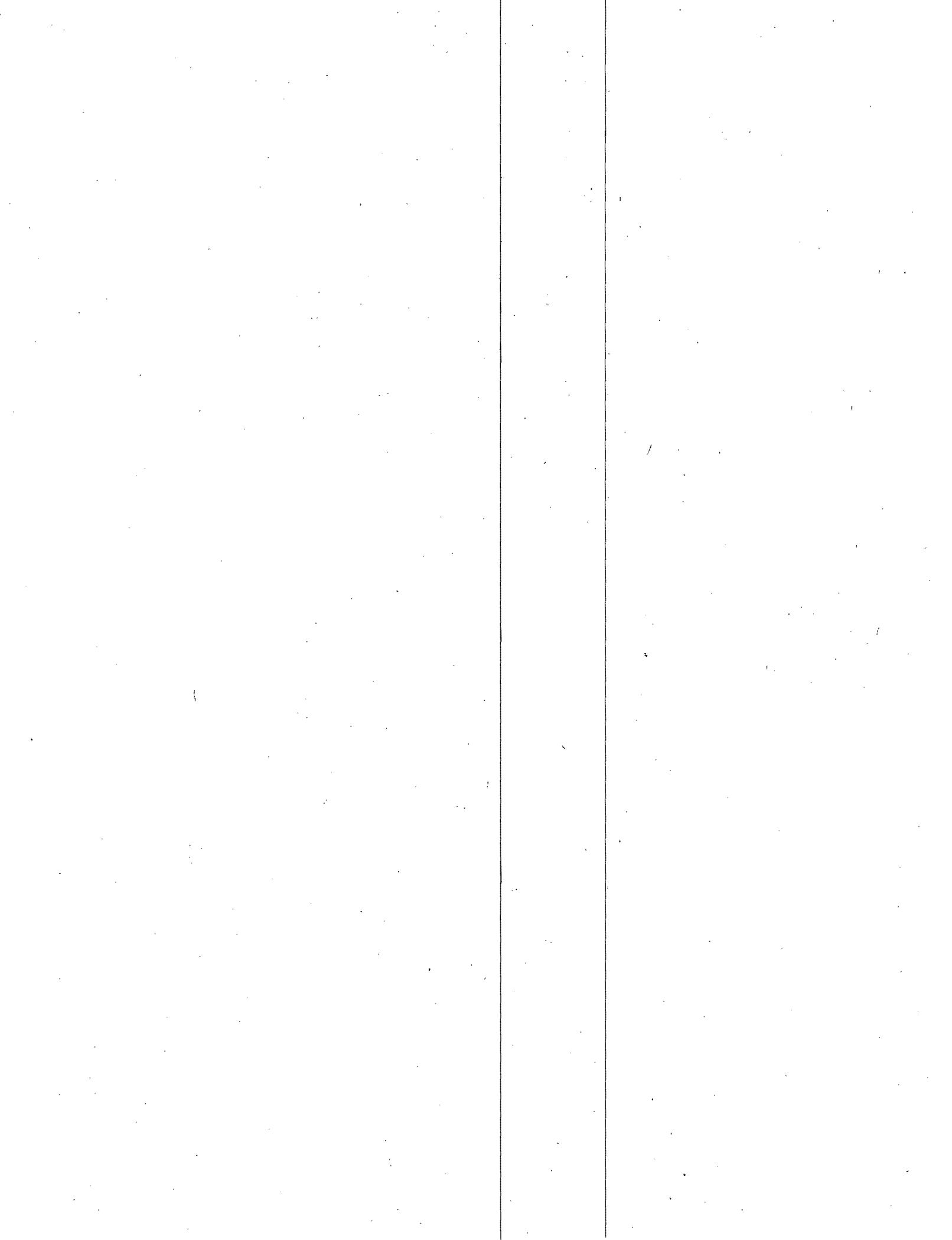
WILLIAMS REFINING, L.L.C.

543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE

TDEC ID NO. 9-791214

Potentiometric Surface Elevation
(feet above mean sea level)





APPENDIX E

HISTORICAL MONITORING DATA

WILLIAMS REFINING, LLC.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Notes:

PSH = Phase separated hydrocarbons

ND = Not detected

NA = Not analyzed

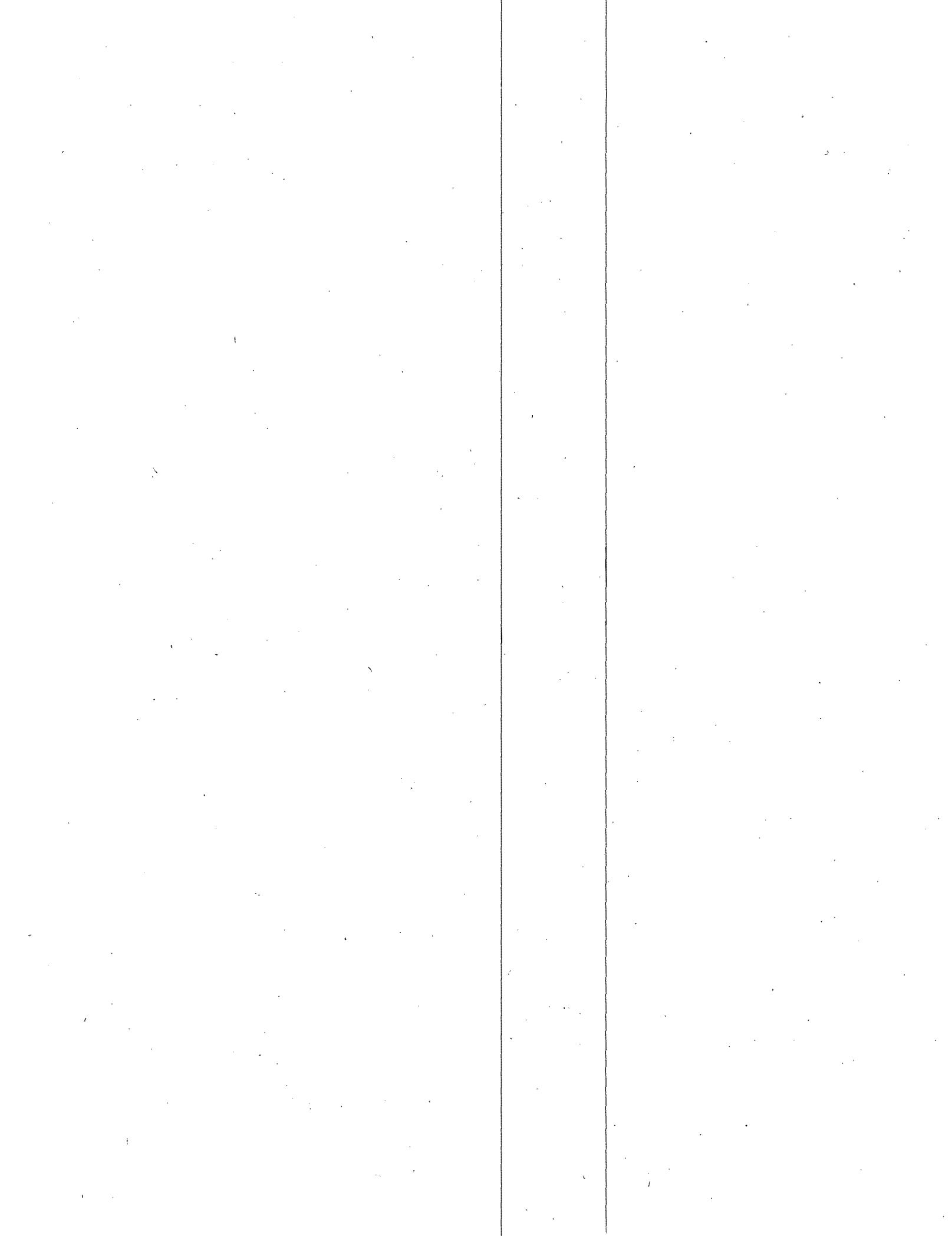
NG = Not gauged

NS = Not sampled

Potentiometric surface elevation corrected to account for specific gravity ($S.G.$) of PSH (if any) using the following formula:

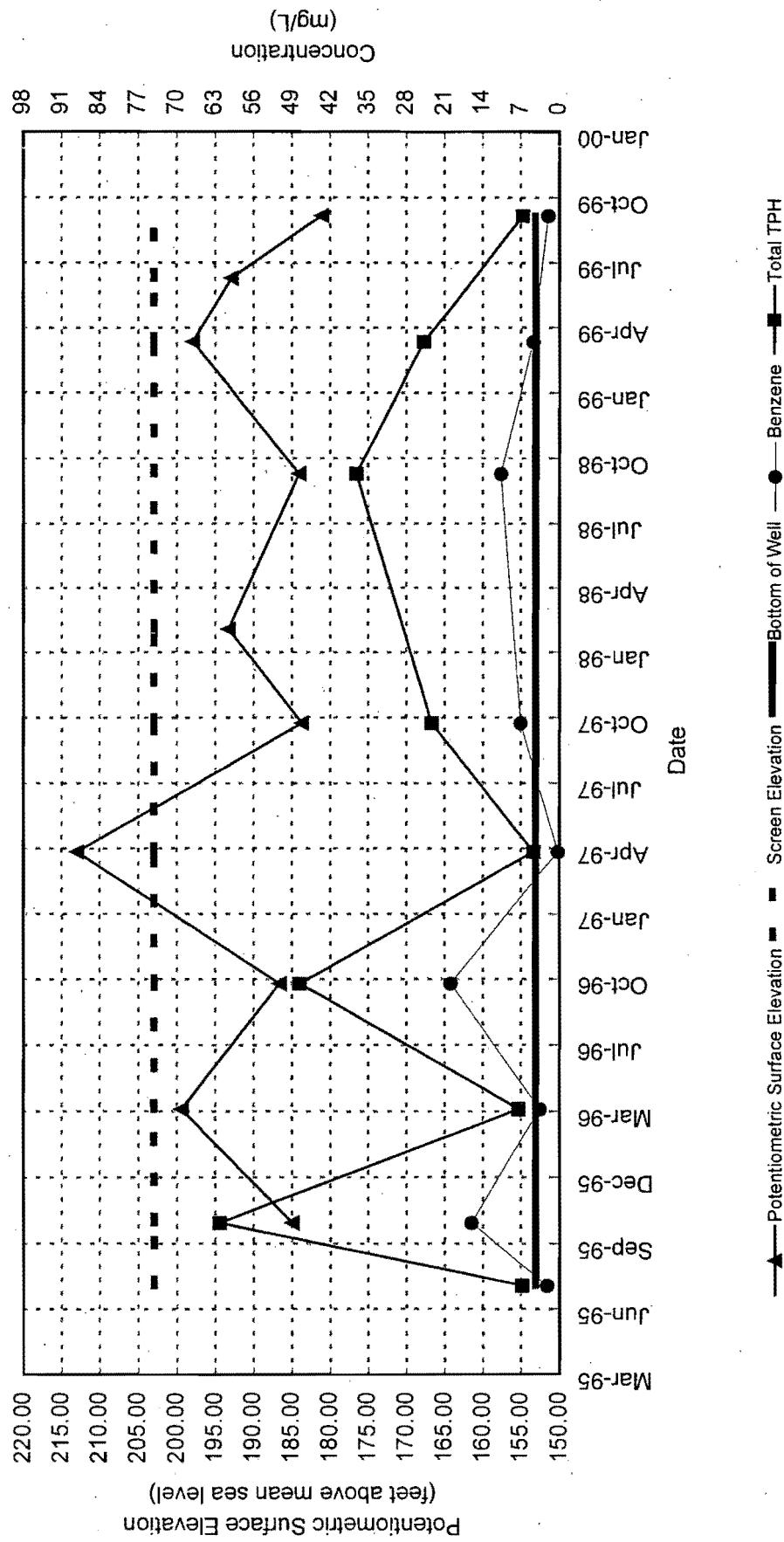
Elevation corrected to account for specific gravity (S.G.) or PSH (if any) using the following formula:

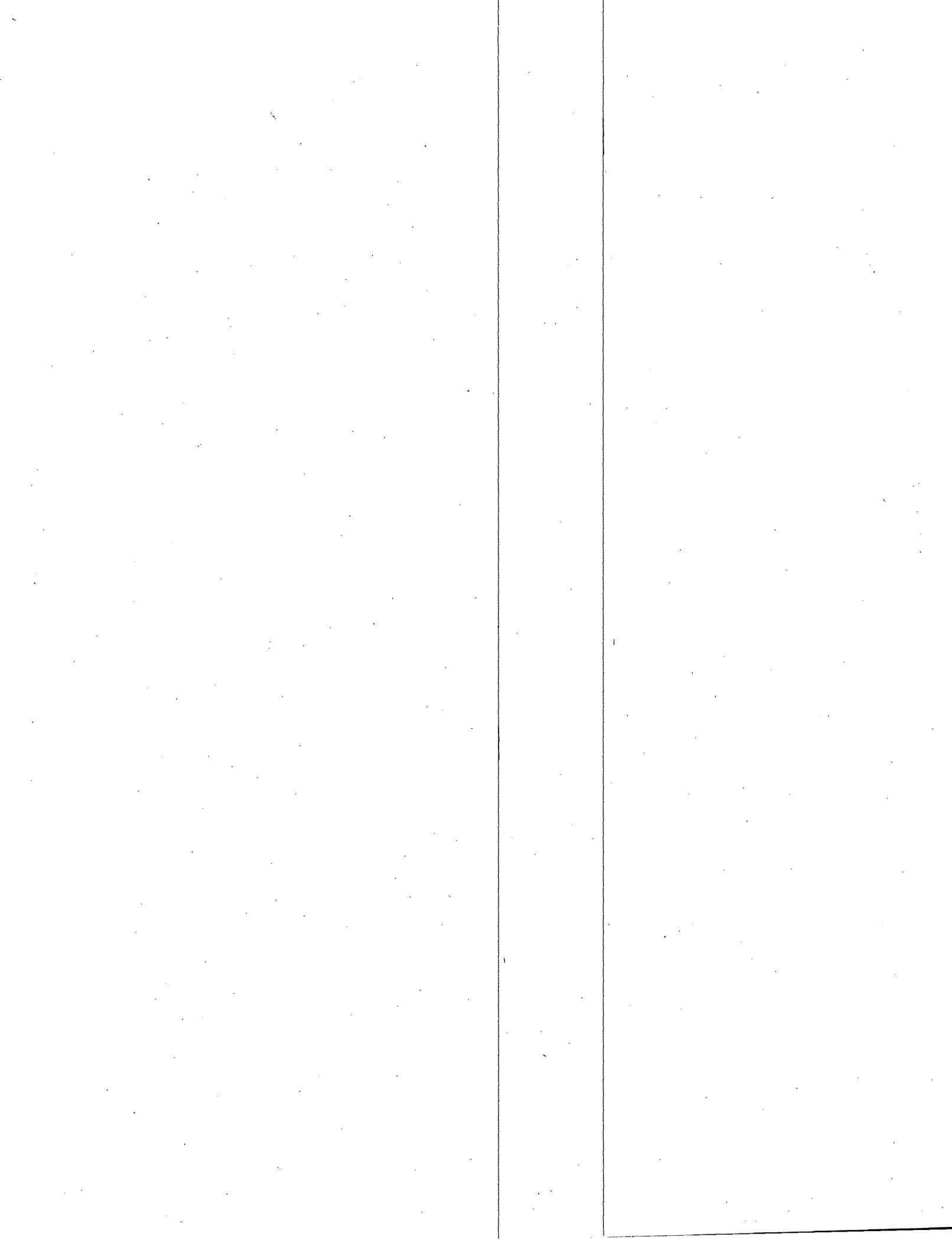
Potentiometric Surface Elevation = Top of Casing Elevation - Depth to Water



MONITORING DATA VS. TIME
OW-31

WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE
TDEC ID NO. 9-791214





APPENDIX E**HISTORICAL MONITORING DATA**

WILLIAMS REFINING, L.L.C.

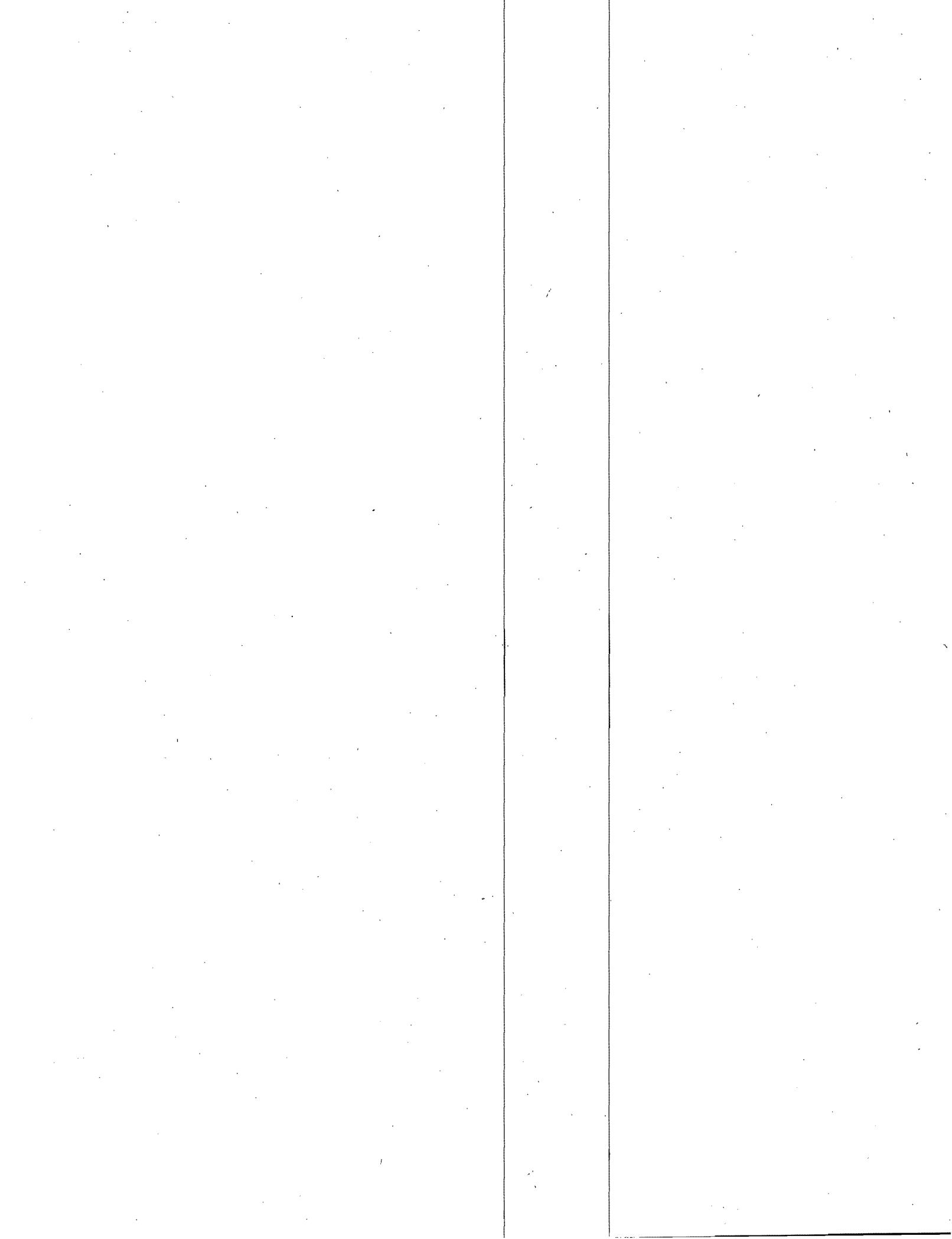
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS

TDEC ID NO. 9-791214

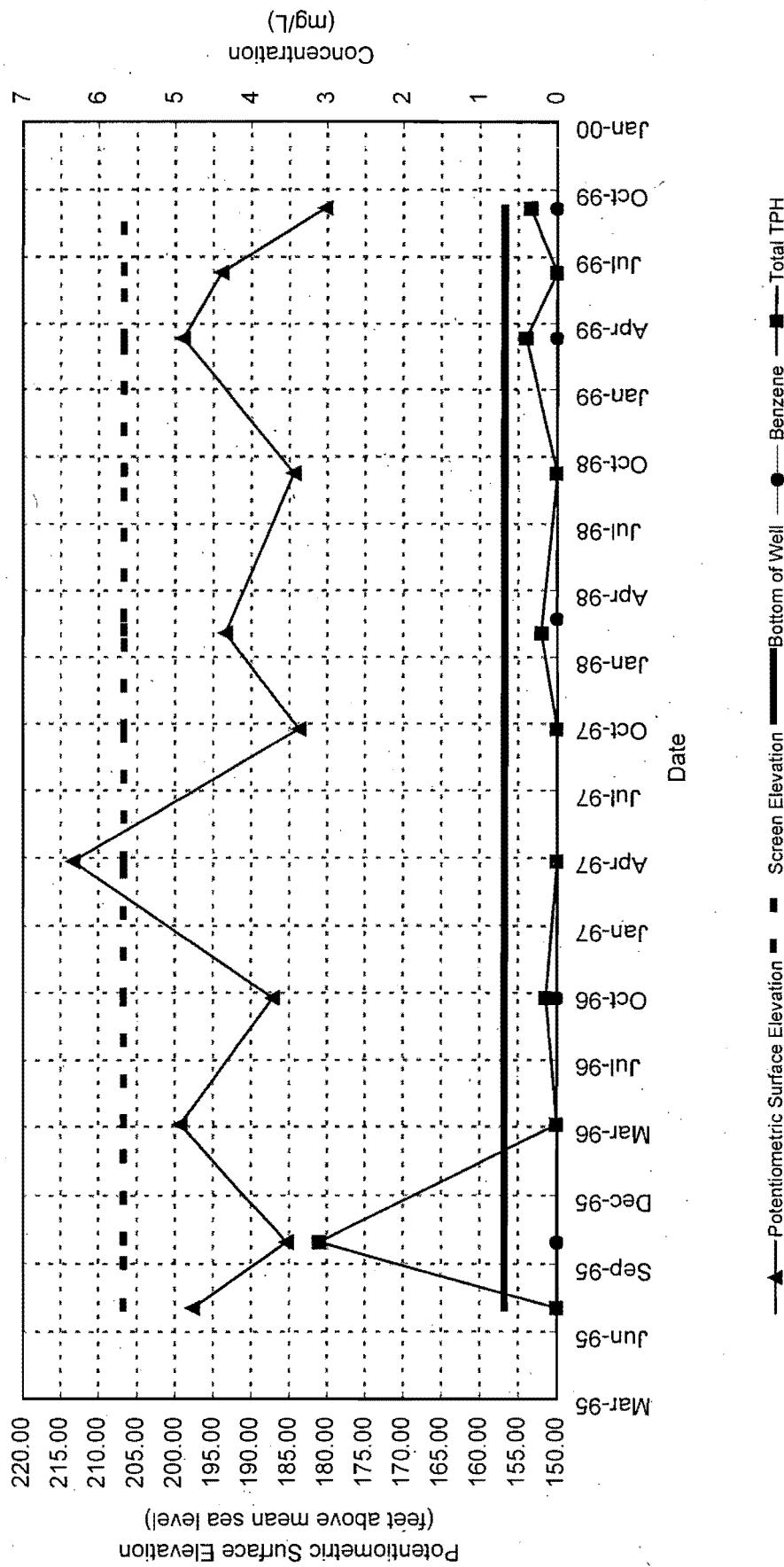
Well: OW-32	Construction:					PSH S.G.	0.80	Assumed
	Top of Casing Elevation	226.74	Depth to Screen	20.00	Well Depth			
Monitoring Date	Note	Measurements in Feet				Concentration listed in mg/L (ppm)		
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation	Benzene	GRO	DRO/EPH
07/28/95		ND	29.09	ND	197.65	ND	ND	ND
10/25/95		ND	41.47	ND	185.27	ND	3.1	ND
04/02/96		ND	27.42	ND	199.32	ND	ND	ND
09/25/96		ND	39.64	ND	187.10	ND	ND	0.14
04/01/97		ND	13.44	ND	213.30	ND	ND	ND
10/01/97		ND	43.04	ND	183.70	ND	ND	ND
02/12/98	1	33.36	33.37	0.01	193.38	ND	ND	0.20
03/04/98		ND	NG	ND	ND	ND	ND	ND
09/23/98		ND	42.30	ND	184.44	ND	ND	ND
03/30/99		ND	27.73	ND	199.01	ND	0.11	0.29
06/30/99		ND	32.83	ND	193.91	ND	ND	ND
09/27/99	2	ND	46.49	ND	180.25	ND	ND	0.34

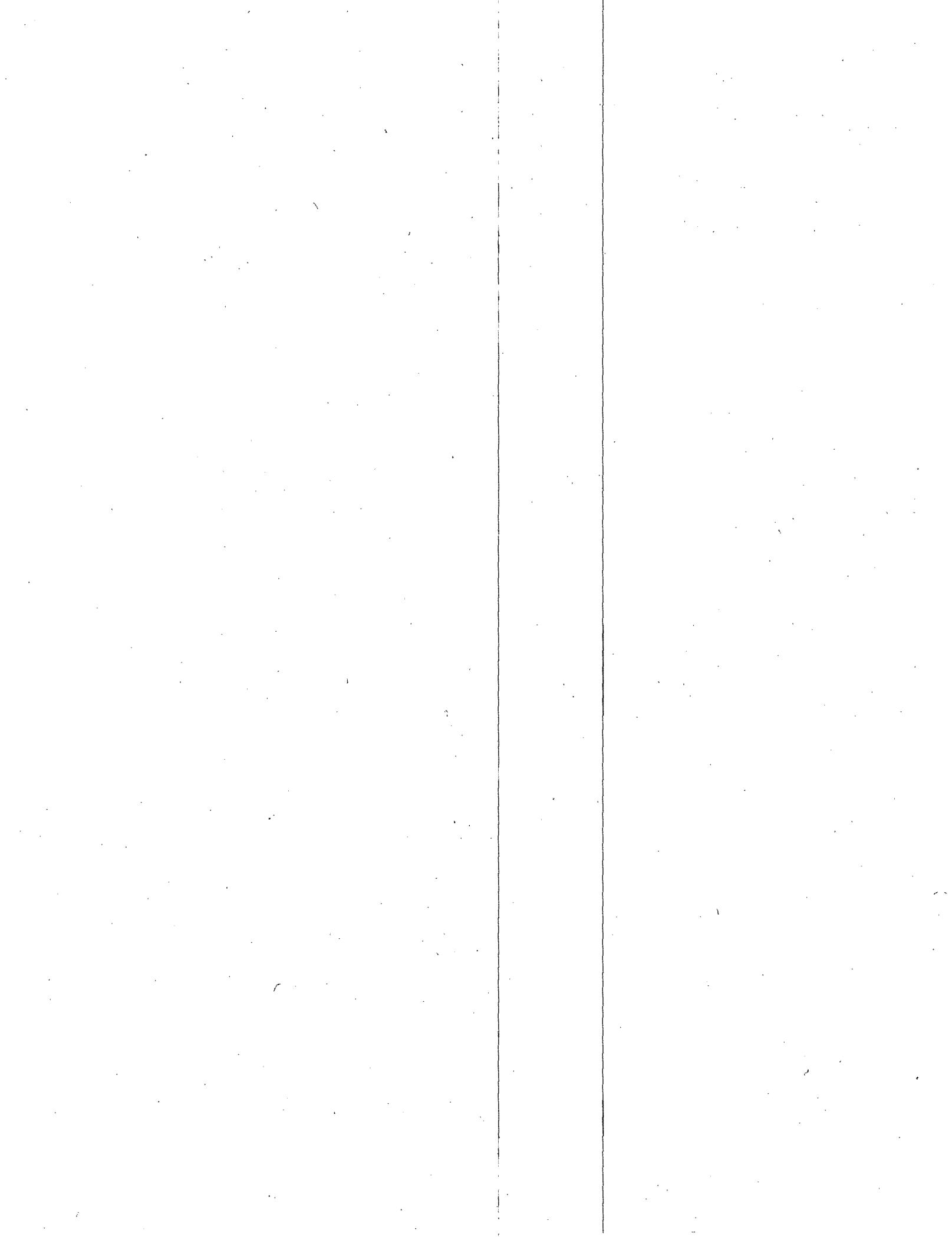
Notes:
 PSH = Phase separated hydrocarbons
 ND = Not detected NA = Not analyzed NG = Not gauged NS = Not sampled
 Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:
 Potentiometric Surface Elevation = Top of Casing Elevation - Depth to Water + (Specific Gravity of PSH x PSH Thickness)
 1] Laboratory holding time exceeded for BTEX - resampled on 3/4/98
 2] Sample aliquots for EPH analysis compromised at lab - re-sampled for EPH analysis on 10/13/99

C:\WILLIAMSREFINERY\DATA\SAMPWELL.XLS



MONITORING DATA VS. TIME
OW-32
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE
TDEC ID NO. 9-791214





APPENDIX E
HISTORICAL MONITORING DATA

WILLIAMS REFINING, L.L.C.
 543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
 TDEC ID NO. 9-781214

Well:	Construction:				PSH S.G.	0.80	Assumed
	Top of Casing Elevation	219.39	Depth to Screen	20.50			
	Well Depth		70.50				
Monitoring Date	Note	Measurements in Feet				Concentration listed in mg/L (ppm)	
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation	Benzene	GRO
07/30/95		ND	16.78	ND	202.61	ND	ND
10/25/95		ND	19.20	ND	200.19	0.002	1.3
04/02/96		ND	18.02	ND	201.37	ND	ND
09/25/96		NG	NG	NG			
04/01/97		NG	NG	NG			
10/01/97		ND	16.82	ND	202.57	ND	2.28
02/12/98	1	ND	17.86	ND	201.53	ND	0.24
03/04/98		ND	NG	ND			
09/24/98		ND	16.27	ND	203.12	ND	ND
03/30/99		ND	15.72	ND	203.67	ND	0.31
06/30/99		ND	16.30	ND	203.09		
09/27/99	2,3	ND	18.85	ND	199.46	ND	ND

Notes:

PSH = Phase separated hydrocarbons

ND = Not detected

NA = Not analyzed

NG = Not gauged

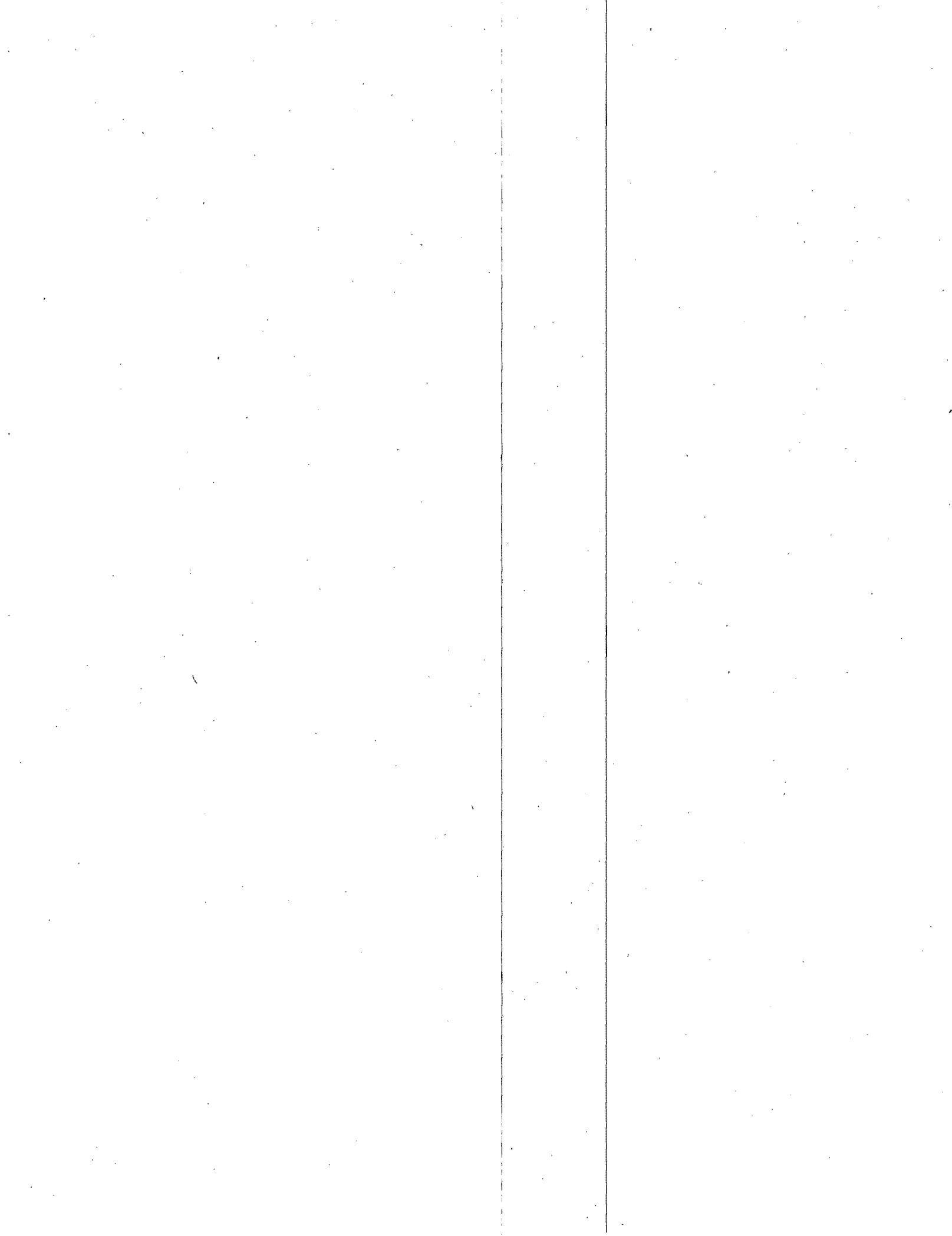
NS = Not sampled

Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:

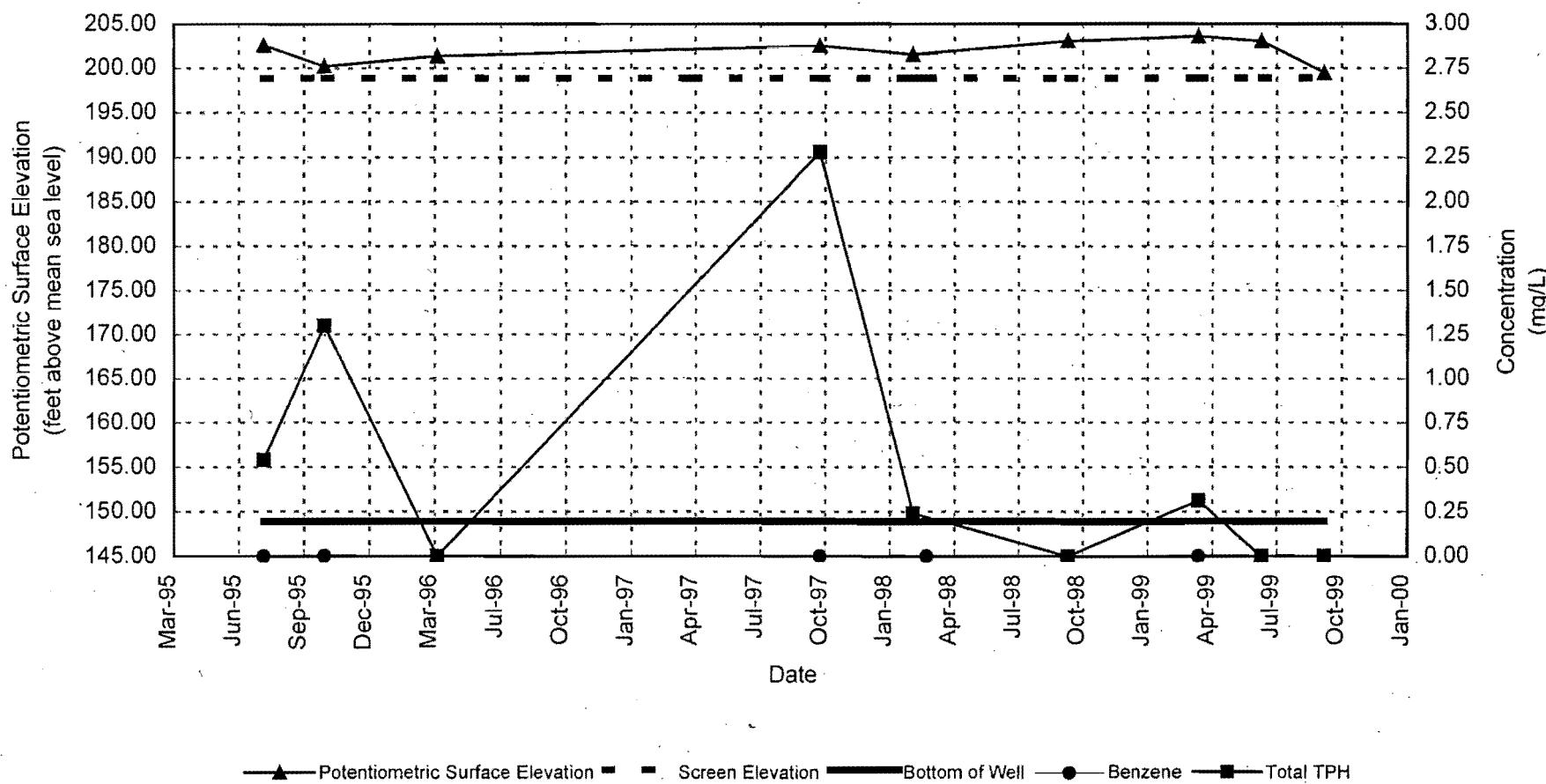
Potentiometric Surface Elevation = Top of Casing Elevation - Depth to Water + (Specific Gravity of PSH x PSH Thickness)

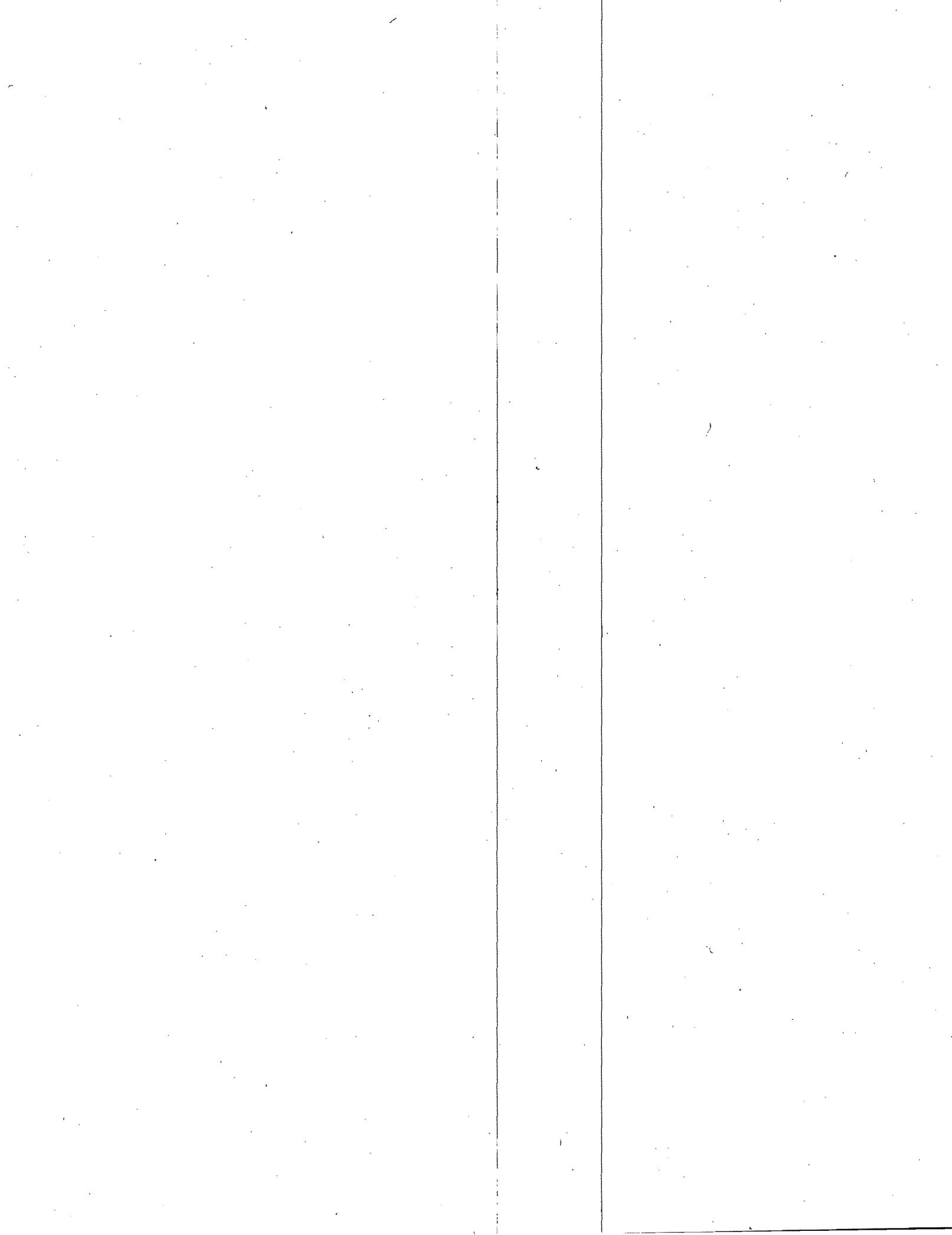
- 1] Laboratory holding time exceeded for BTEX - resampled on 3/4/98
- 2] Sample aliquots for EPH analysis compromised at lab - re-sampled for EPH analysis on 10/13/99
- 3] OW-34 was abandoned prior to gauging and sampling - Data presented is from OW-34[R], which was installed adjacent to OW-34

C:\WILLIAMREFINERY\DATA\SAMPWELL.XLS



MONITORING DATA VS. TIME
OW-34
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE
TDEC ID NO. 9-791214



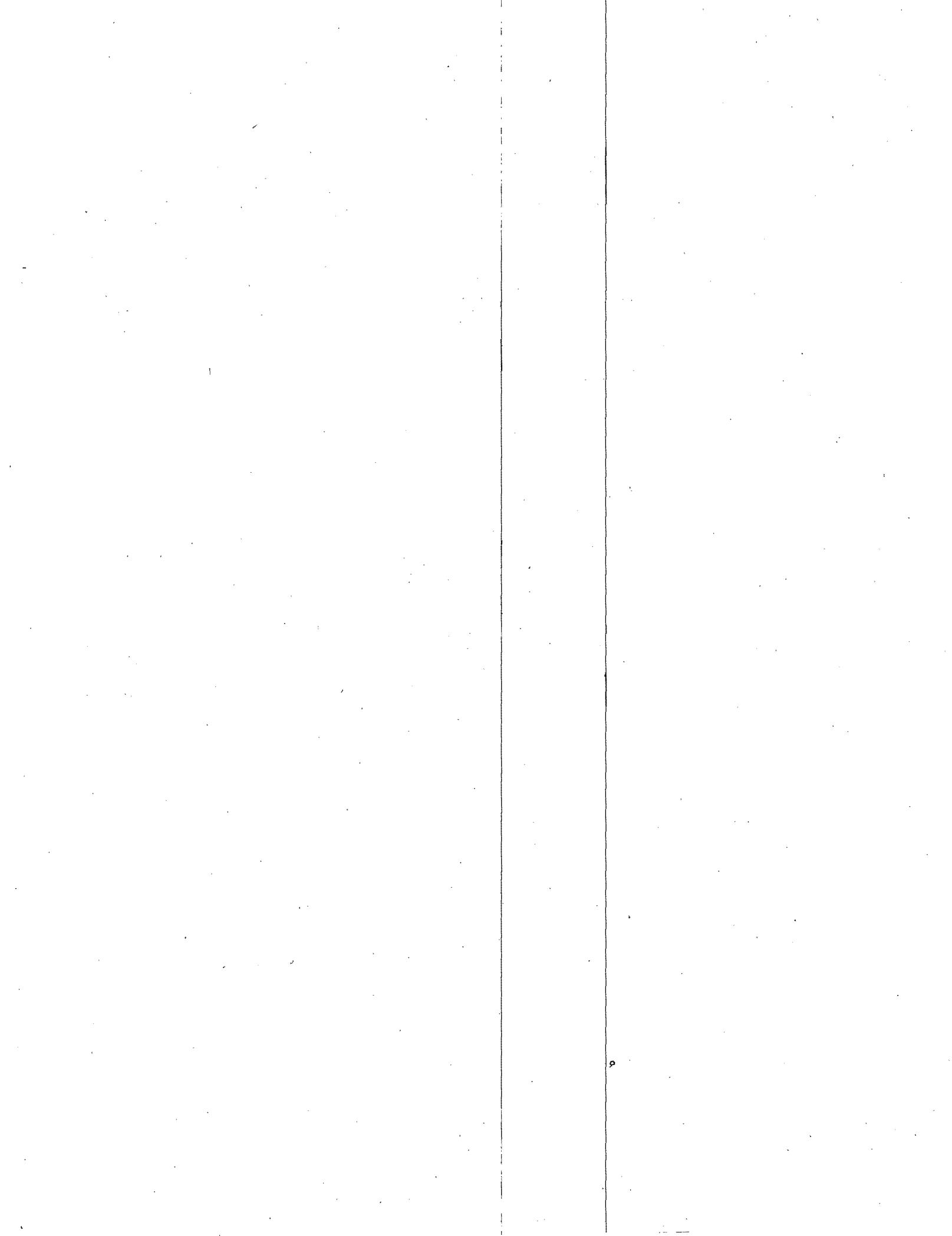


APPENDIX E
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

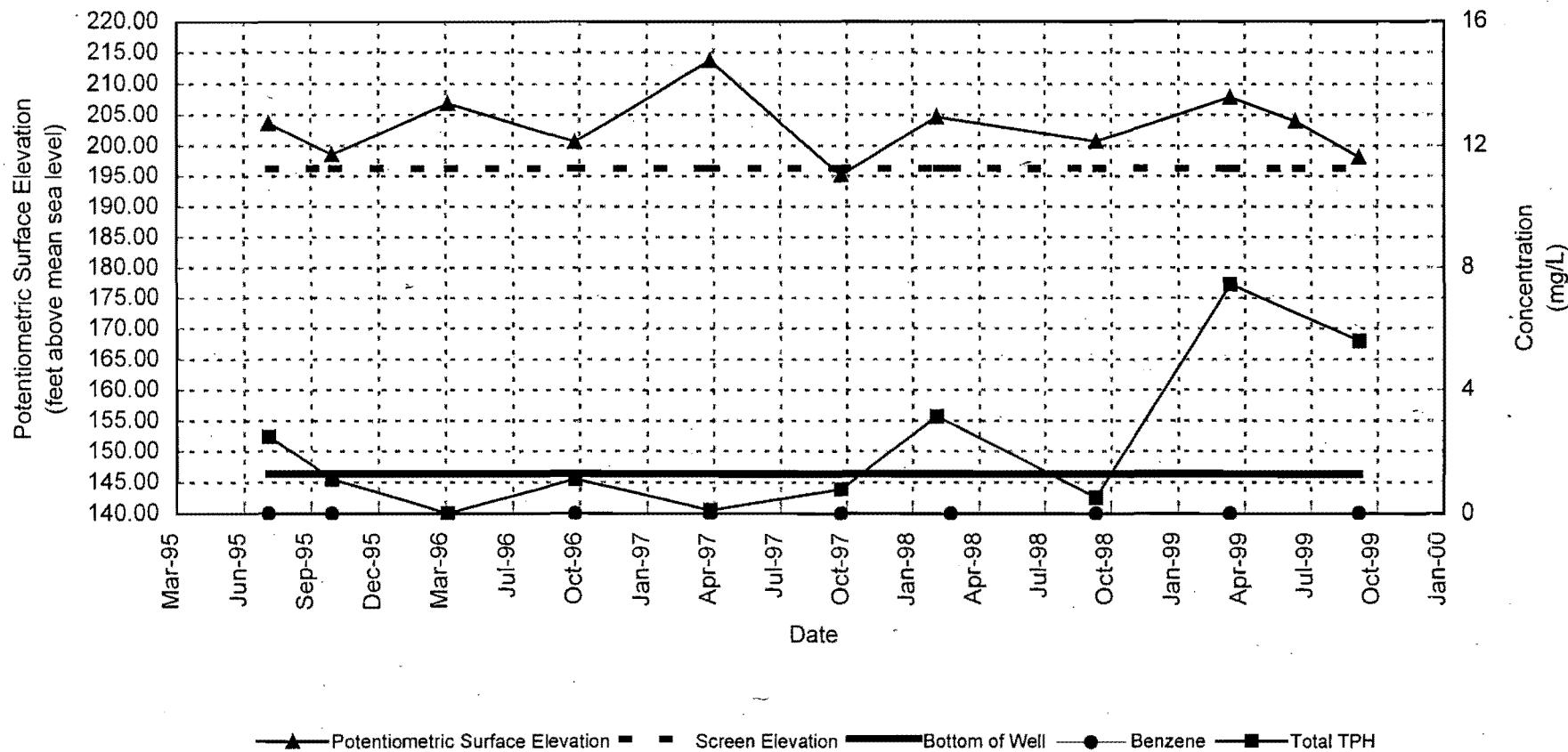
Well:	Construction:				PSH S.G.	0.80	Assumed
	Top of Casing Elevation	216.32	Depth to Screen	20.00			
	Well Depth		70.00				
Measurements in Feet							
Monitoring Date	Note	Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation	Concentration listed in mg/L (ppm)	
07/29/95		ND	12.72	ND	203.60	ND	ND
10/25/95		ND	17.77	ND	198.55	ND	1.1
04/02/96		ND	9.47	ND	206.85	ND	ND
09/25/96		ND	15.70	ND	200.62	ND	0.2
04/01/97		ND	2.56	ND	213.76	ND	0.102
10/01/97		ND	21.17	ND	195.15	ND	0.28
02/12/98	1	ND	11.65	ND	204.67	ND	0.12
03/04/98		ND	NG	ND	ND	ND	ND
09/25/98		ND	15.64	ND	200.68	ND	ND
03/30/99		ND	8.47	ND	207.85	0.001	0.13
06/30/99		ND	12.35	ND	203.97	ND	7.32
09/27/99	2	ND	18.18	ND	198.14	0.0128	0.34
							5.25

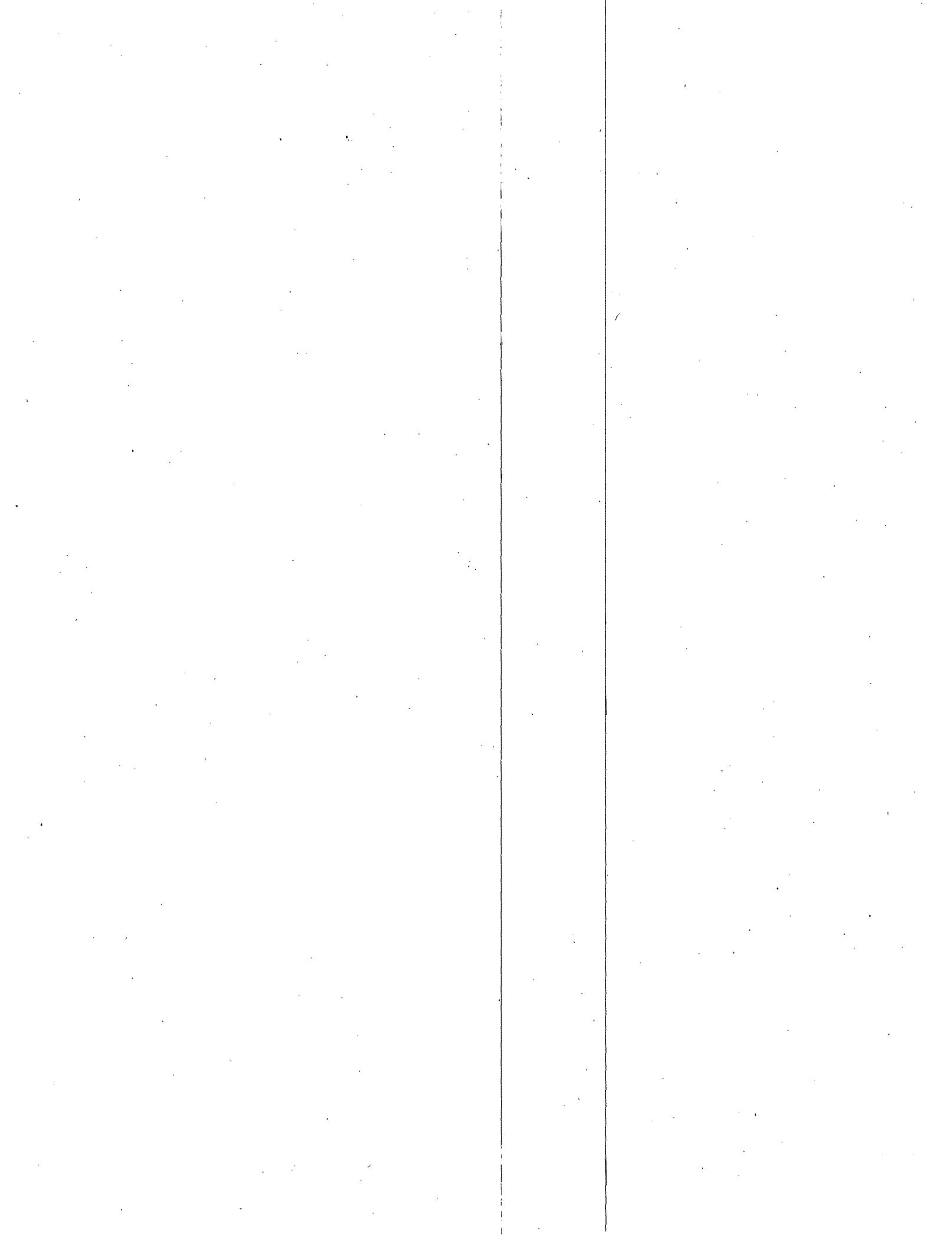
Notes:
 PSH = Phase separated hydrocarbons
 ND = Not detected NA = Not analyzed NG = Not gauged NS = Not sampled
 Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:
 Potentiometric Surface Elevation = Top of Casing Elevation - Depth to Water + (Specific Gravity of PSH x PSH Thickness)
 1] Laboratory holding time exceeded for BTEX - resampled on 3/4/98
 2] Sample aliquots for EPH analysis compromised at lab - re-sampled for EPH analysis on 10/13/99

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MONITORING DATA VS. TIME
OW-38
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE
TDEC ID NO. 9-791214





APPENDIX E

HISTORICAL MONITORING DATA

WILLIAMS REFINING, L.L.C.

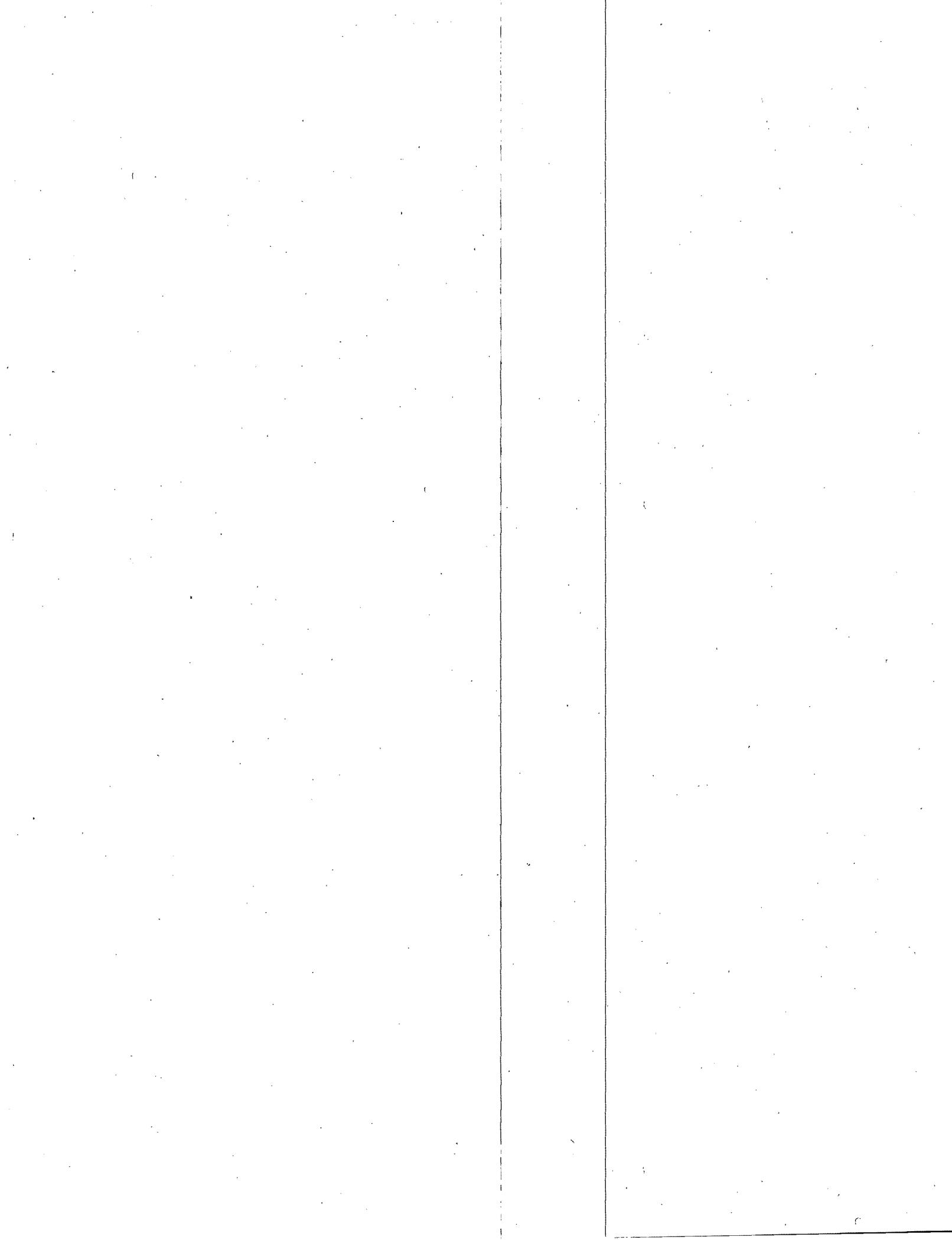
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS

TDEC ID NO. 9-791214

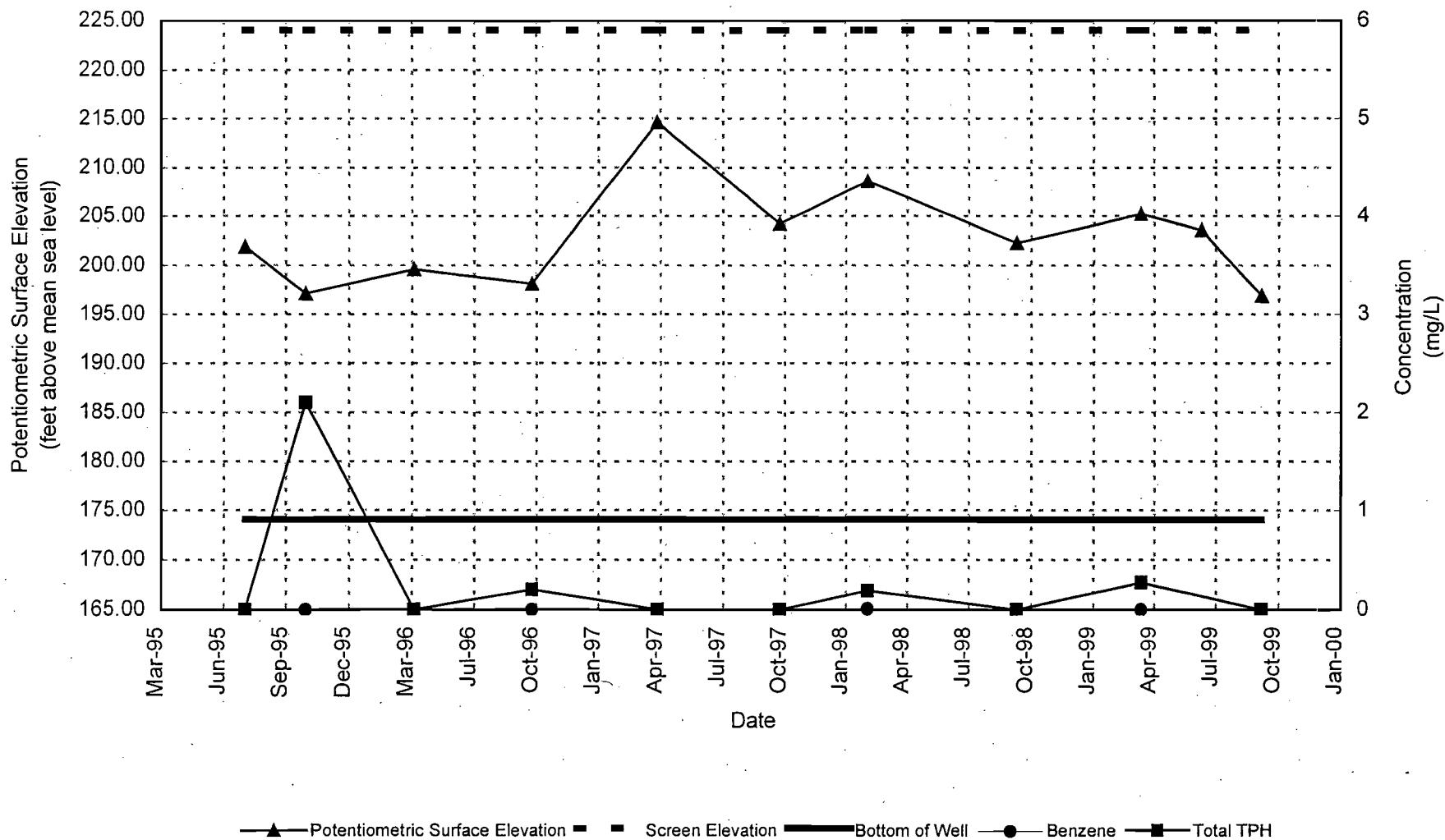
Well:		Construction:			PSH S.G.	0.80	Assumed	
OW-40		Top of Casing Elevation	244.06					
		Depth to Screen	20.00					
		Well Depth	70.00					
Monitoring Date		Measurements in Feet			Concentration listed in mg/L (ppm)			
		Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation	Benzene	GRO	DRO/EPH
07/27/95		ND	42.15	ND	201.91	ND	ND	ND
10/25/95		ND	46.97	ND	197.09	ND	2.1	ND
04/02/96		ND	44.48	ND	199.58	ND	ND	ND
09/25/96		ND	45.95	ND	198.11	ND	ND	0.2
04/01/97		ND	29.44	ND	214.62	ND	ND	ND
10/01/97		ND	39.84	ND	204.22	ND	ND	ND
02/12/98		ND	35.51	ND	208.55	0.01	ND	0.19
09/24/98		ND	41.77	ND	202.29	ND	ND	ND
03/30/99		ND	38.84	ND	205.22	ND	ND	0.27
06/30/99		ND	40.48	ND	203.58			
09/27/99	1	ND	47.21	ND	196.85	ND	ND	ND

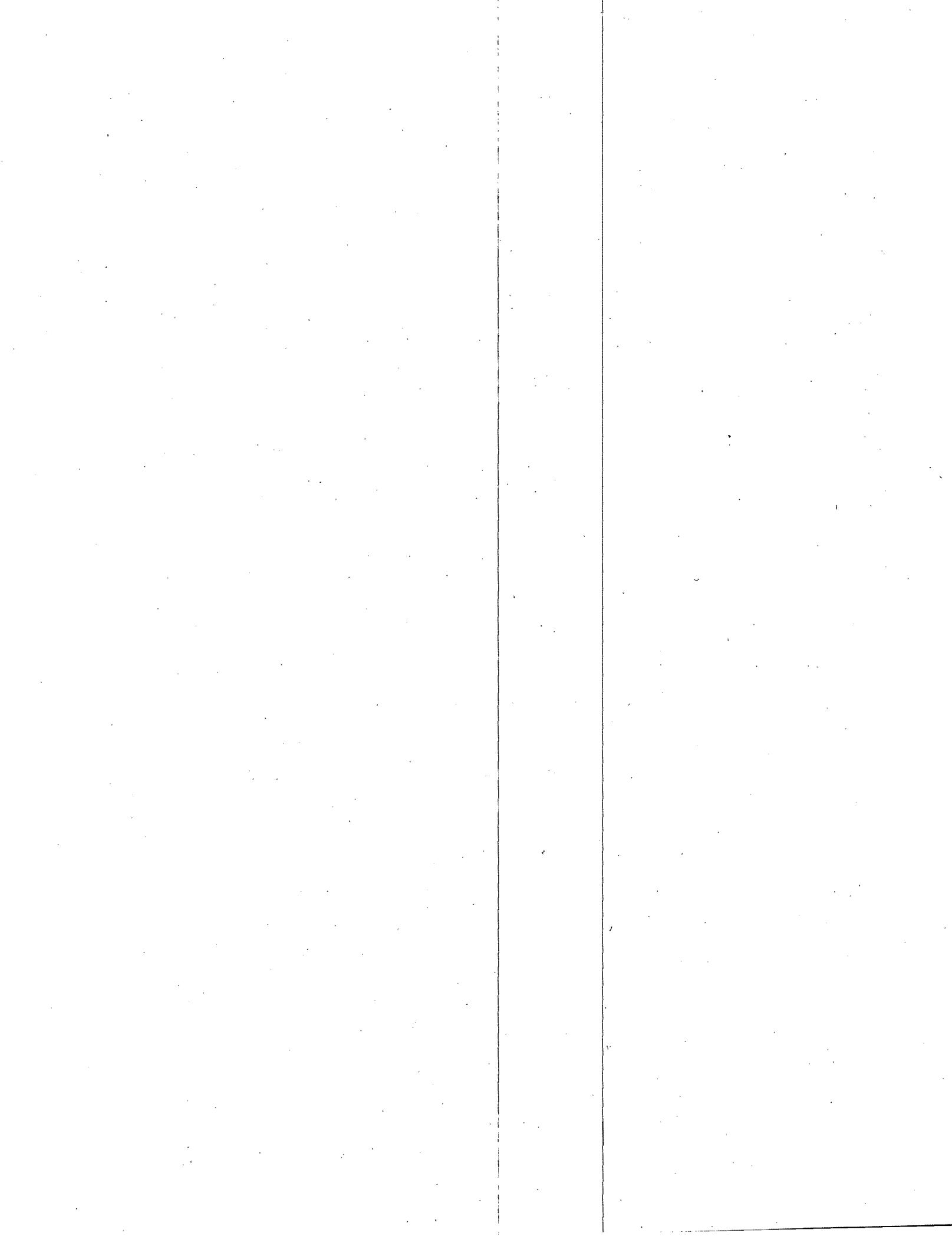
Notes:
 PSH = Phase separated hydrocarbons
 ND = Not detected NA = Not analyzed NG = Not gauged NS = Not sampled
 Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:
 Potentiometric Surface Elevation = Top of Casing Elevation - Depth to Water + (Specific Gravity of PSH x PSH Thickness)
 1] Sample aliquots for EPH analysis compromised at lab - re-sampled for EPH analysis on 10/13/99

D:\WILLIAMREFINERY\DATA\SAMPWELL.XLS



MONITORING DATA VS. TIME
OW-40
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE
TDEC ID NO. 9-791214



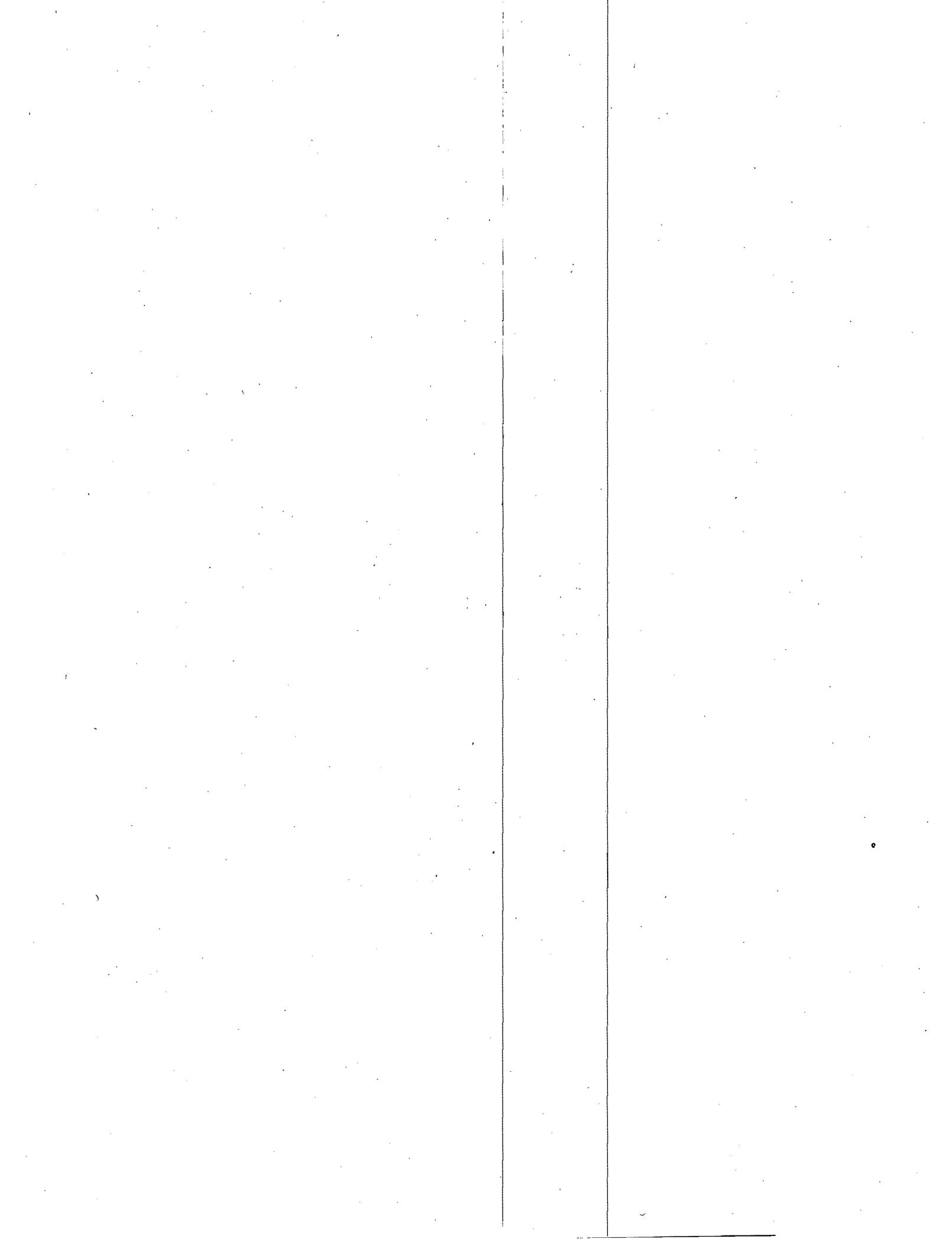


APPENDIX E
HISTORICAL MONITORING DATA
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSESS
TDEC ID NO. 9-791214

Well:		Construction:			PSH S.G.	0.80	Assumed
OW-43		Top of Casing Elevation	238.42				
Monitoring Date	Note	Depth to Screen	20.00				
		Well Depth	70.00				
		Measurements in Feet			Concentration listed in mg/L (ppm)		
Monitoring Date	Note	Depth to PSH	Depth to Water	PSH Thickness	Potentiometric Surface Elevation	Benzene	GRO
07/27/95		ND	46.00	ND	192.42	0.011	0.42
10/25/95		ND	53.95	ND	184.47	0.004	2.7
04/02/96		ND	45.10	ND	193.32	ND	ND
09/25/96		ND	52.10	ND	186.32	ND	0.22
04/01/97		ND	29.56	ND	208.86	ND	0.468
10/01/97		ND	53.54	ND	184.88	0.021	0.48
02/12/98		ND	48.32	ND	190.10	ND	ND
09/24/98		ND	52.58	ND	185.84	ND	0.45
03/30/99		ND	41.96	ND	196.46	ND	ND
06/30/99		ND	46.00	ND	192.42		
09/27/99	1	ND	57.42	ND	181.00	0.0081	ND
							0.37

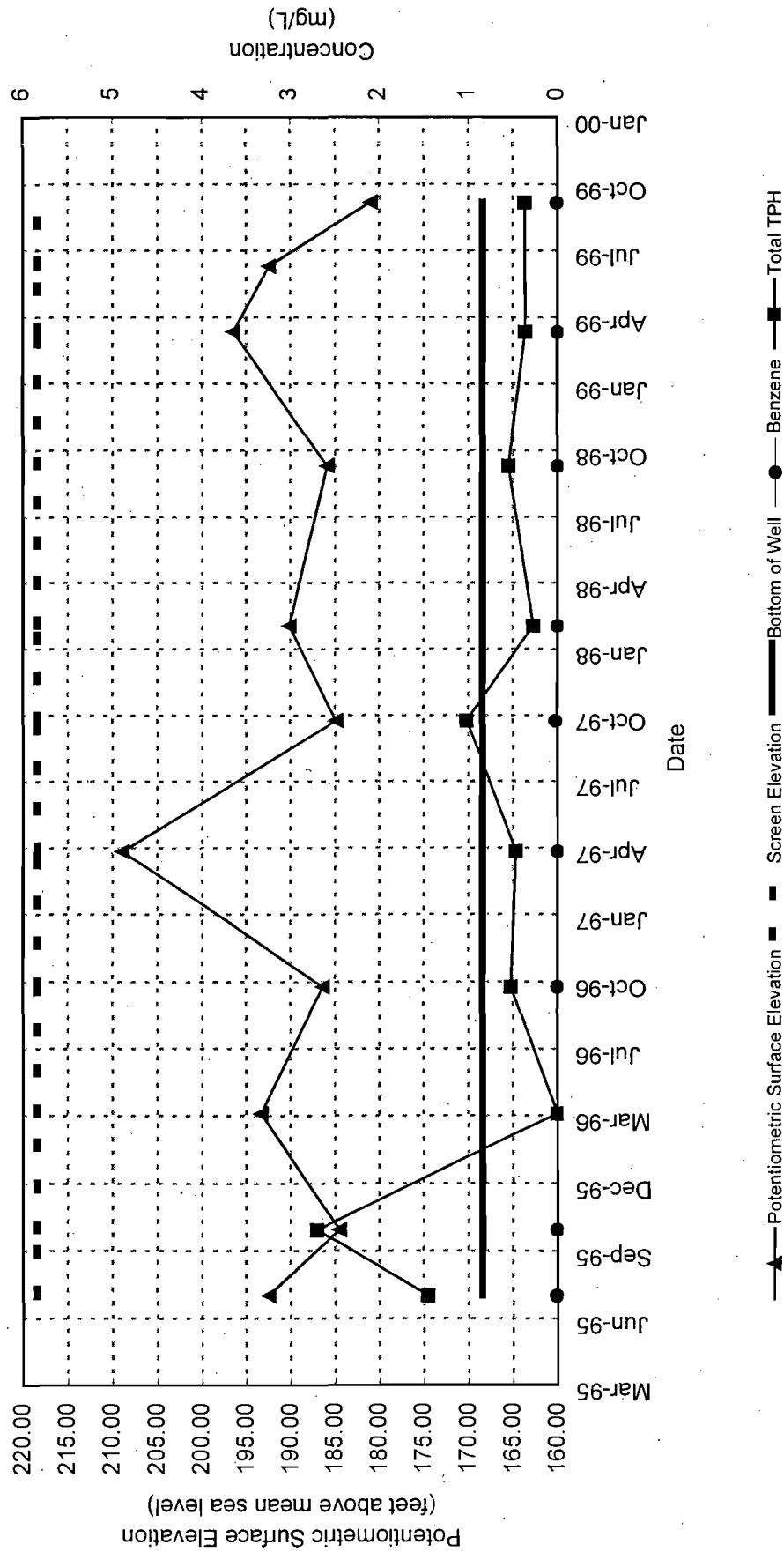
Notes:
 PSH = Phase separated hydrocarbons
 ND = Not detected NA = Not analyzed NG = Not gauged NS = Not sampled
 Potentiometric surface elevation corrected to account for specific gravity (S.G.) of PSH (if any) using the following formula:
 Potentiometric Surface Elevation = Top of Casing Elevation - Depth to Water + (Specific Gravity of PSH x PSH Thickness)
 1] Sample aliquots for EPH analysis compromised at lab - re-sampled for EPH analysis on 10/13/99

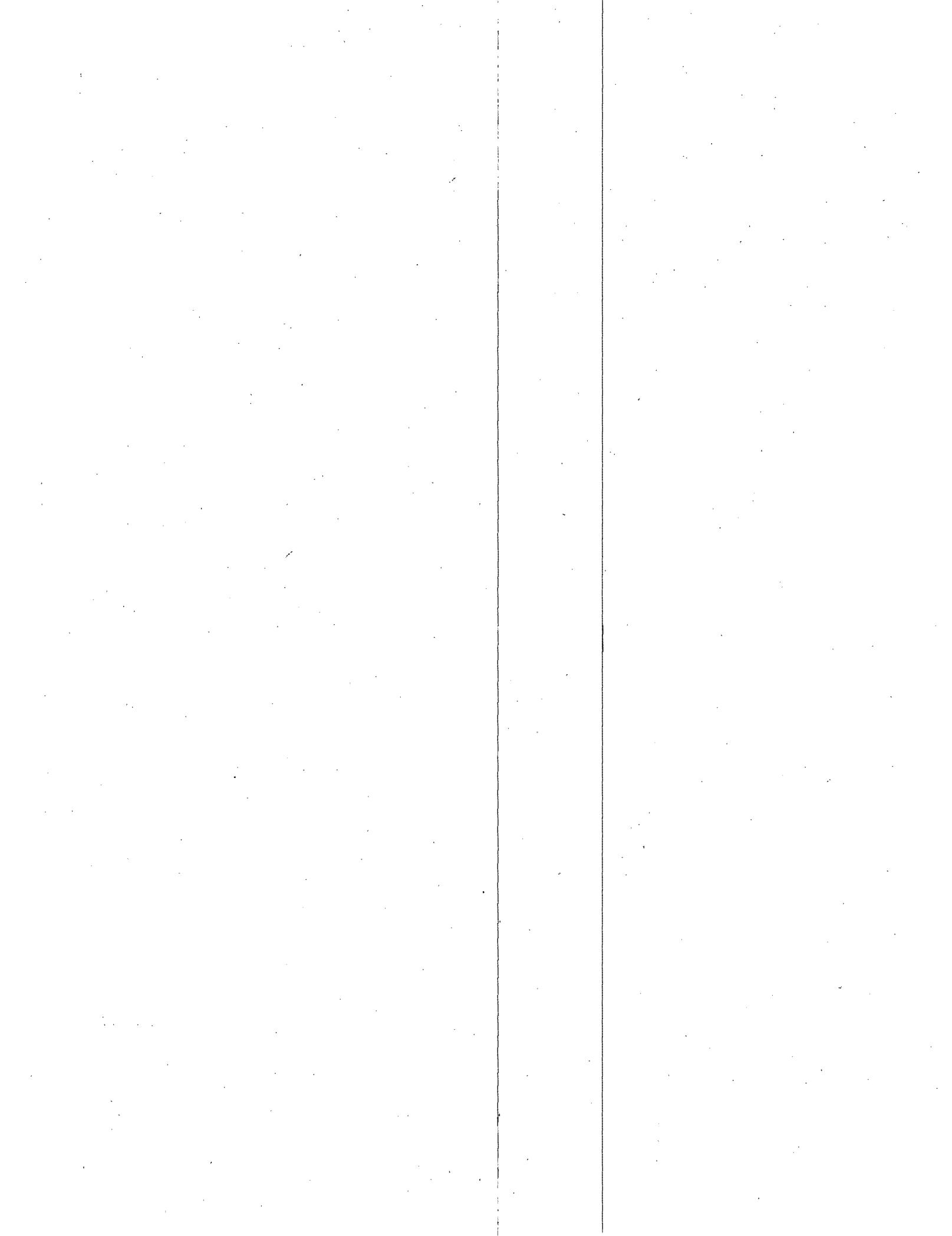
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MONITORING DATA VS. TIME
OW-43

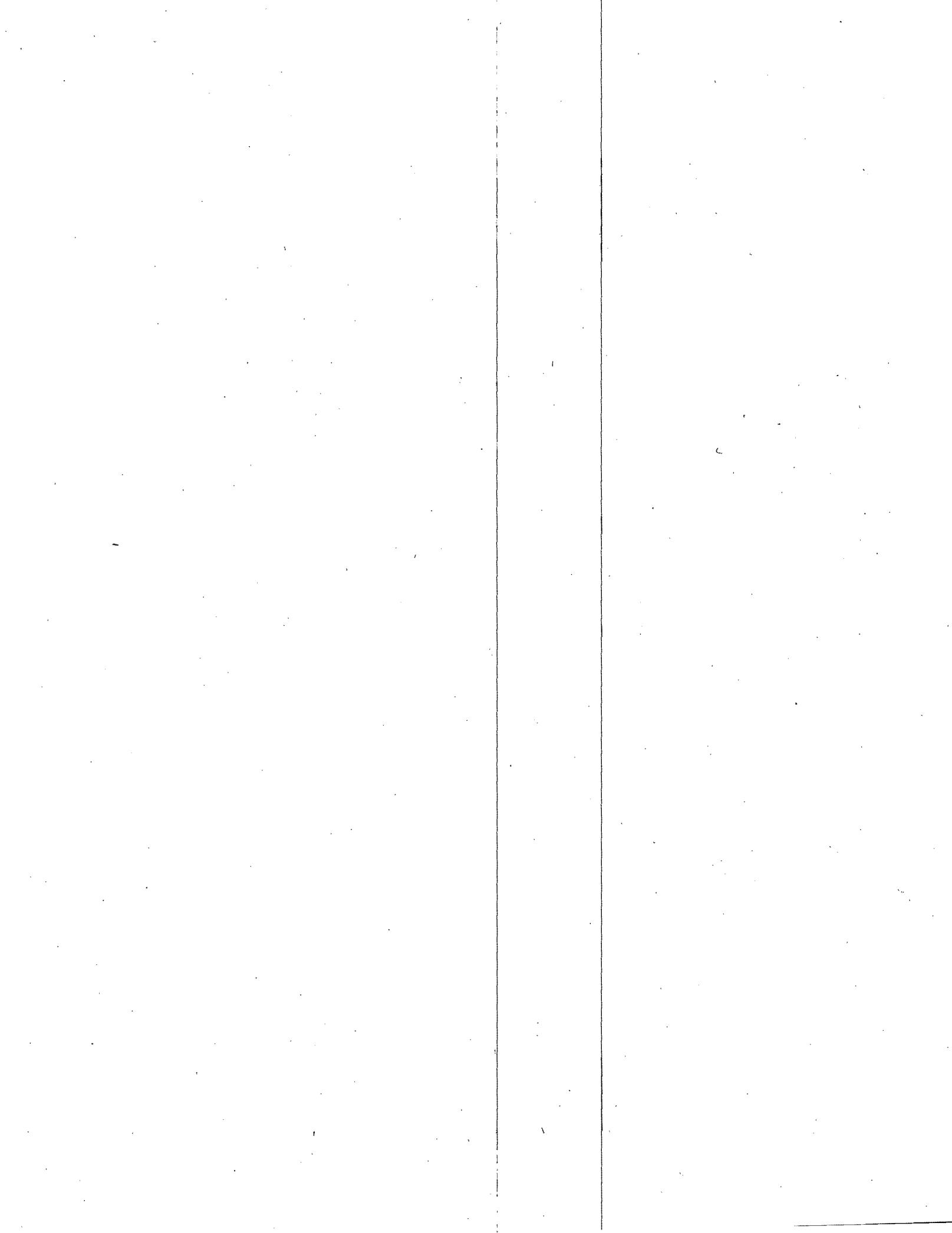
WILLIAMS REFINING, L.L.C.
543 WEST MALLORY AVENUE, MEMPHIS, TENNESSEE
TDEC ID NO. 9-791214





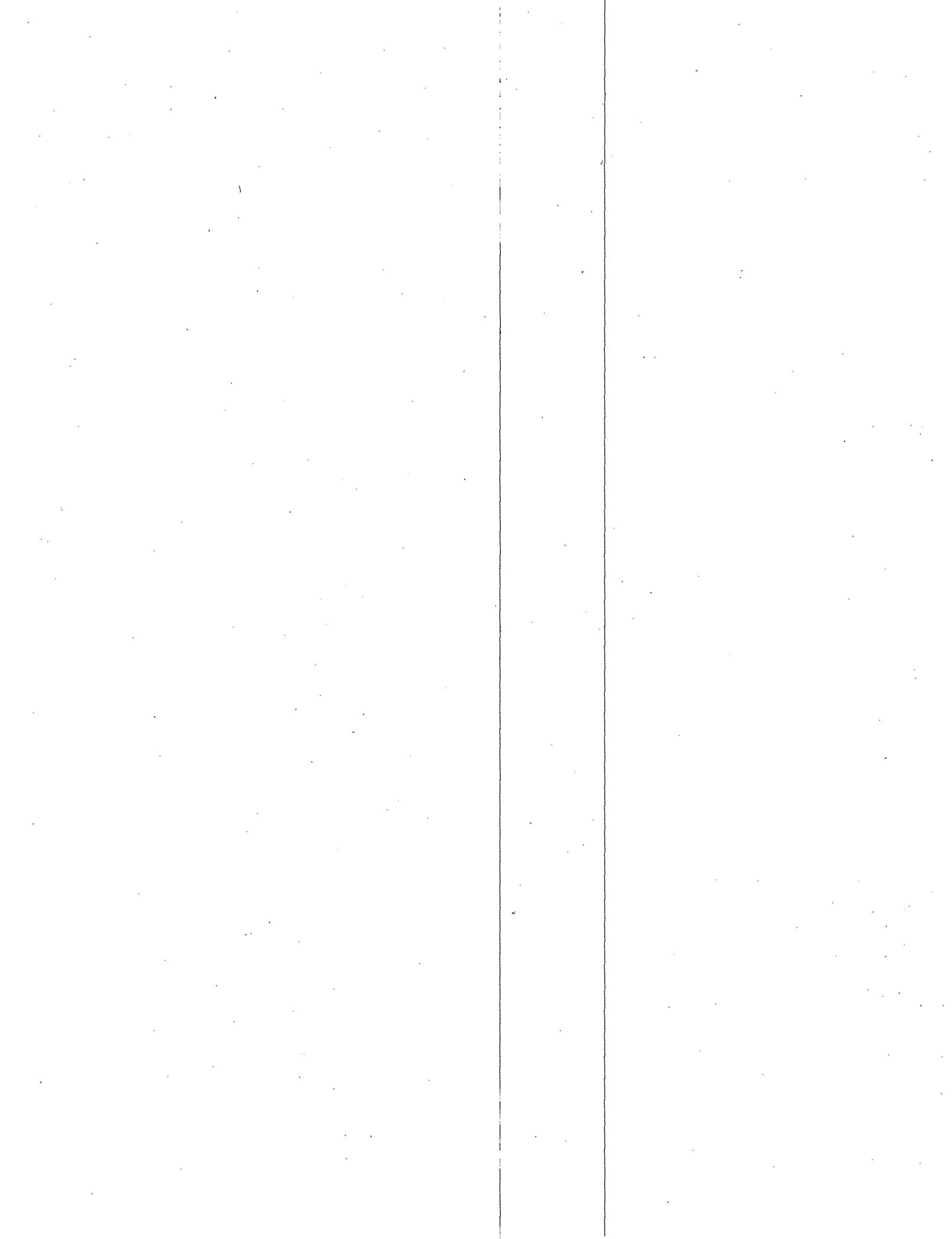
APPENDIX

F



APPENDIX F

WELL CLOSURE AND INSTALLATION PERMITS





MEMPHIS AND SHELBY COUNTY HEALTH DEPARTMENT

YVONNE S. MADLOCK
Director

JOHN B. KIRKLEY, M.D.
Interim Health Officer

DR. W. W. HERENTON
Mayor of Memphis



JIM ROUT
Mayor of Shelby County

June 11, 1999

Mr. Bruce A Shaw, Project Manager
IT Corporation
2606 Corporate Avenue, Suite 191
Memphis, TN 38654

RE: **EMERGENCY CONSTRUCTION OF RECOVERY WELL(S) AT: 543 West Mallory Avenue
(Williams Refinery)**
Permit #99-052 RW-3(R)

Dear Mr. Shaw:

This letter is to inform you that a construction permit has been issued to your selected well driller, approving the above referenced recovery well(s). We appreciate the cooperation you have given the Health Department during the application review process. Please be reminded of the following requirements:

1. The Health Department is to be notified when construction of the well(s) begins.
2. The Health Department is to be notified if the well driller violates any of the conditions for which the permit was issued.
3. The Health Department is to be notified for prior approval of any changes in plans for construction such as a well site location, number of wells needed, well usage such as converting a recovery well to a monitoring well, or in the well driller initially selected to do the work.
4. Well logs on the well(s) are to be submitted to this Office within thirty (30) days of work completion.

Once again, your cooperation in this matter will be appreciated. Should you have any questions or need additional information, you can contact Mr. Greg Parker at (901) 544-7741.

Sincerely,

J. Carter S. Gray, Manager
POLLUTION CONTROL SECTION

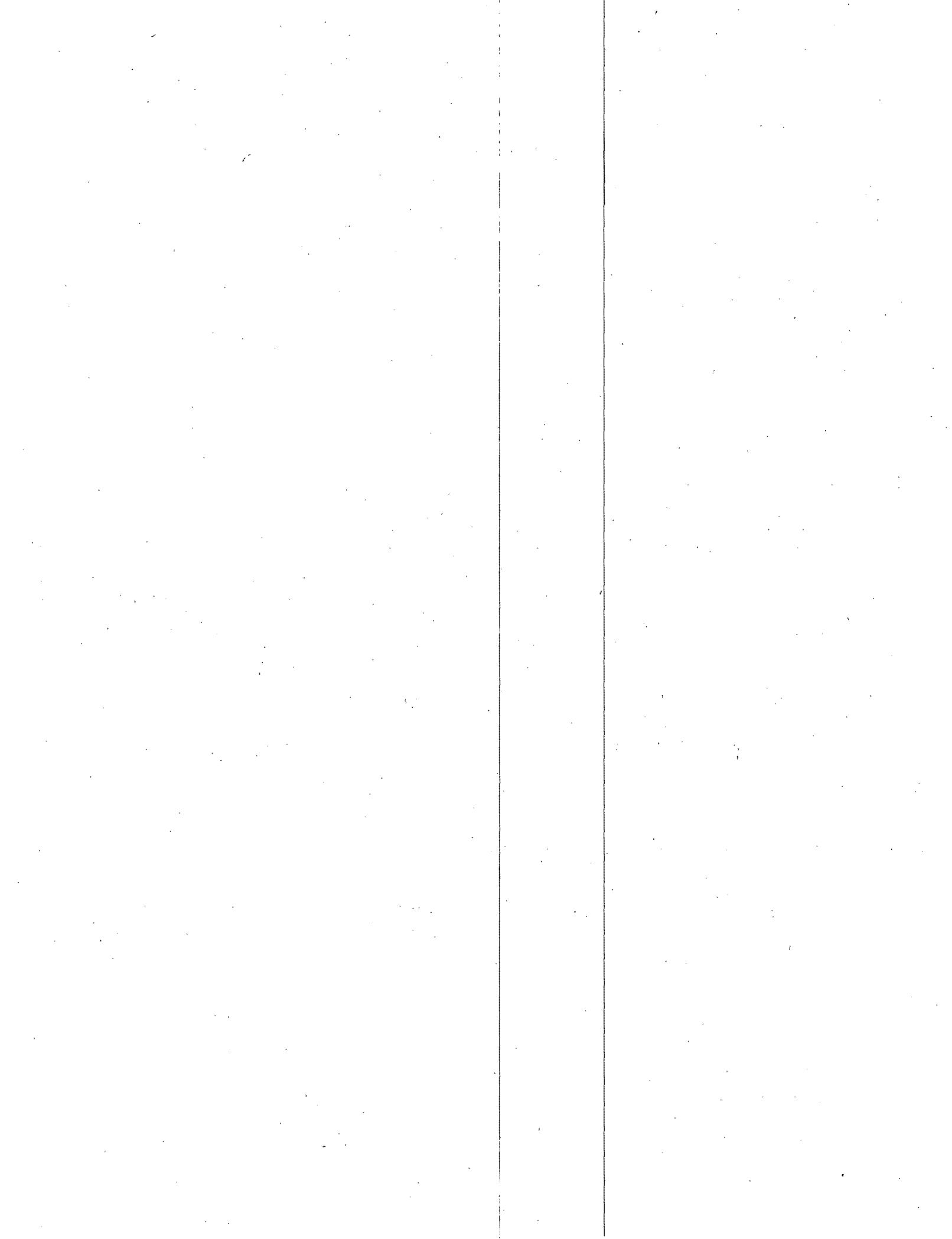
CP:JCS:mpc
Enclosure

Mission

To promote, protect and improve the health and environment of all Shelby County residents.

814 JEFFERSON AVENUE, MEMPHIS, TENNESSEE 38105

Phone (901) 544-7600



WATER QUALITY CONTROL

Memphis and Shelby County Health Department

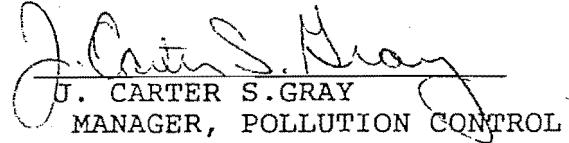
RECOVERY WELL CONSTRUCTION PERMIT

WELL DRILLING COMPANY	TRI STATE TESTING AND DRILLING
ADDRESS	6756 Buckles Cove Memphis, TN 38133
DATE ISSUED	3/12/99 EXPIRATION DATE 6/12/99 PERMIT # 99-052
DESCRIPTION OF WORK	Construction of Recovery Wells at: 543 West Mallory Ave.
EMERGENCY PERMIT	Williams Refinery RW-3(R)

This permit is issued based on signed commitment by the driller and the owner of said well to fully comply with the requirements set forth in the approved application or as directed by the Memphis and Shelby County Health Department. Deviation from the approved application or any conditions that are set forth by the Health Department shall void this permit.

CONDITIONS:

1. Any water in drilling the wells shall be obtained from a potable source of water and a chlorine residual maintained throughout the drilling process.
2. All applicable fees must be paid to the Memphis\Shelby County Health Department.
3. The Health Department shall be notified just before construction is to begin.
4. A copy of the well logs shall be submitted to the Health Department within (30) thirty days of completion.
5. All requirements outlined in the Rules and Regulations shall be complied with.
6. Any changes in the number of wells needed, or in their location or or construction such as conversion to a monitoring well shall be brought to the attention of the Health Department.
7. Any additional wells that may be needed at a later will require a separate application be filed with this office along with the \$25 processing fee and the \$100 inspection fee.
8. Any abandoned wells shall be properly sealed as required by the Health Department.

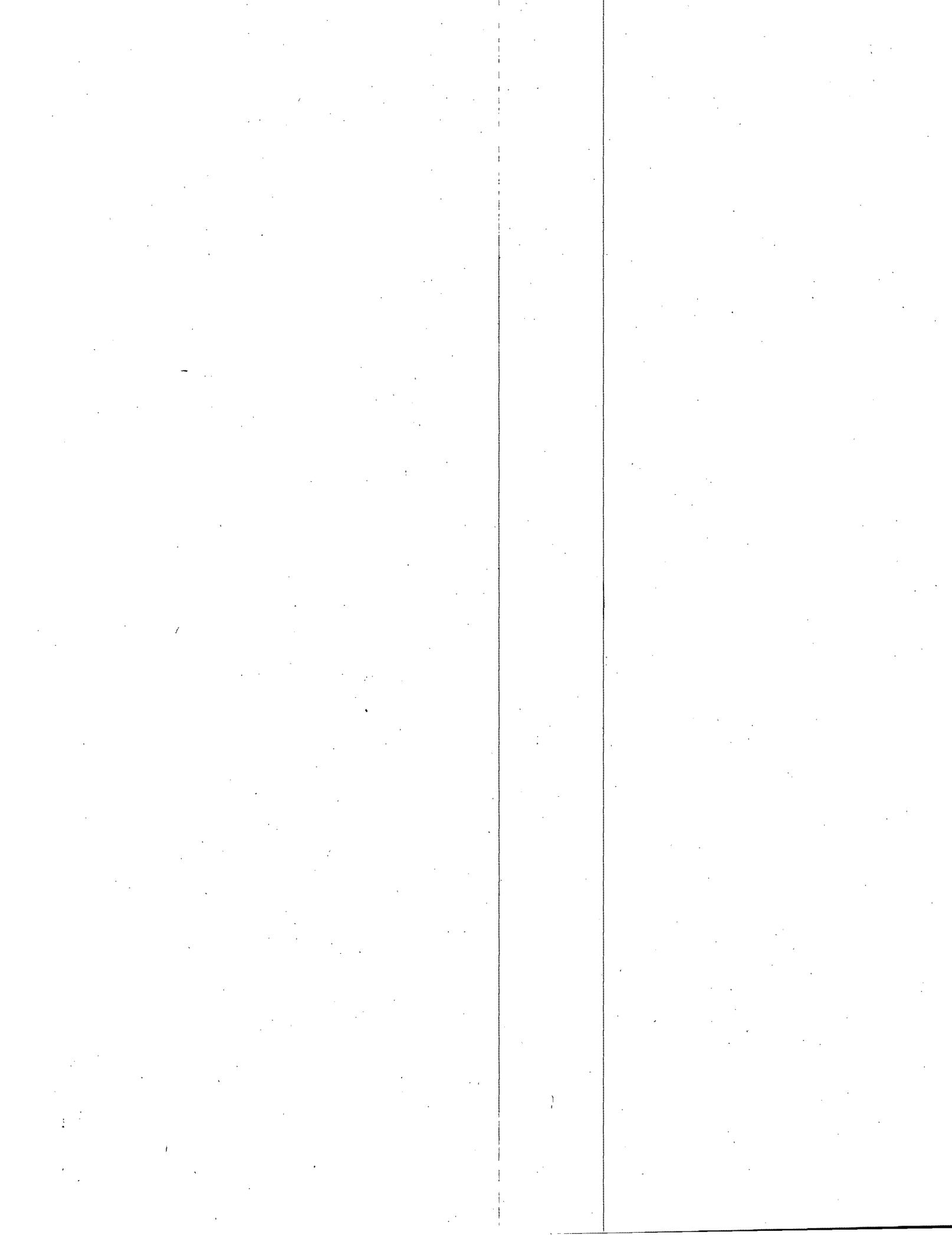

J. CARTER S. GRAY
MANAGER, POLLUTION CONTROL

No authority is granted by this permit to construct, operate, or maintain any well in violation of any law, statute, code, ordinance, rule, or regulation of Memphis and Shelby County, Tennessee.

NON TRANSFERABLE

POST OR FILE AT CONSTRUCTION SITE

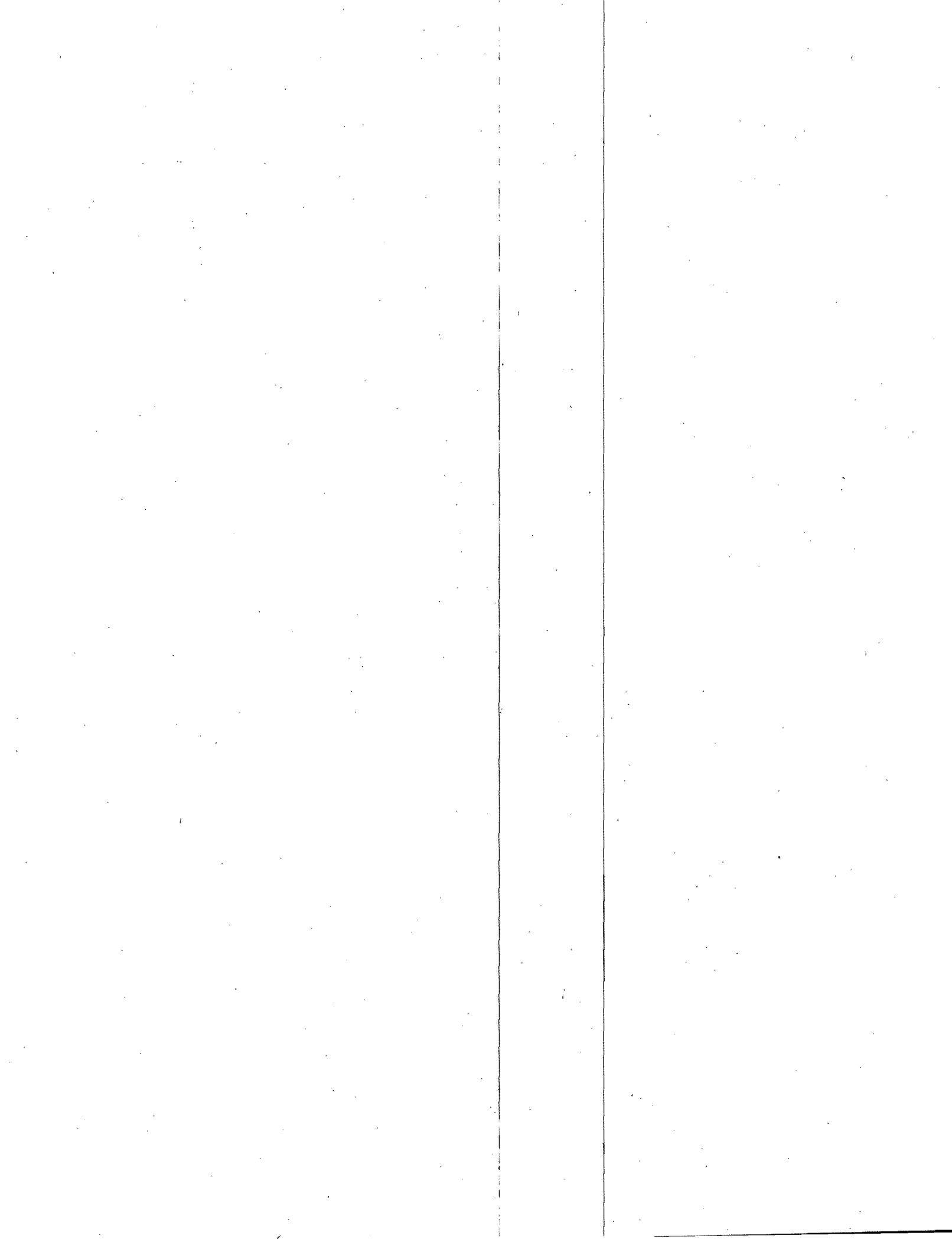
GP 6/14/99



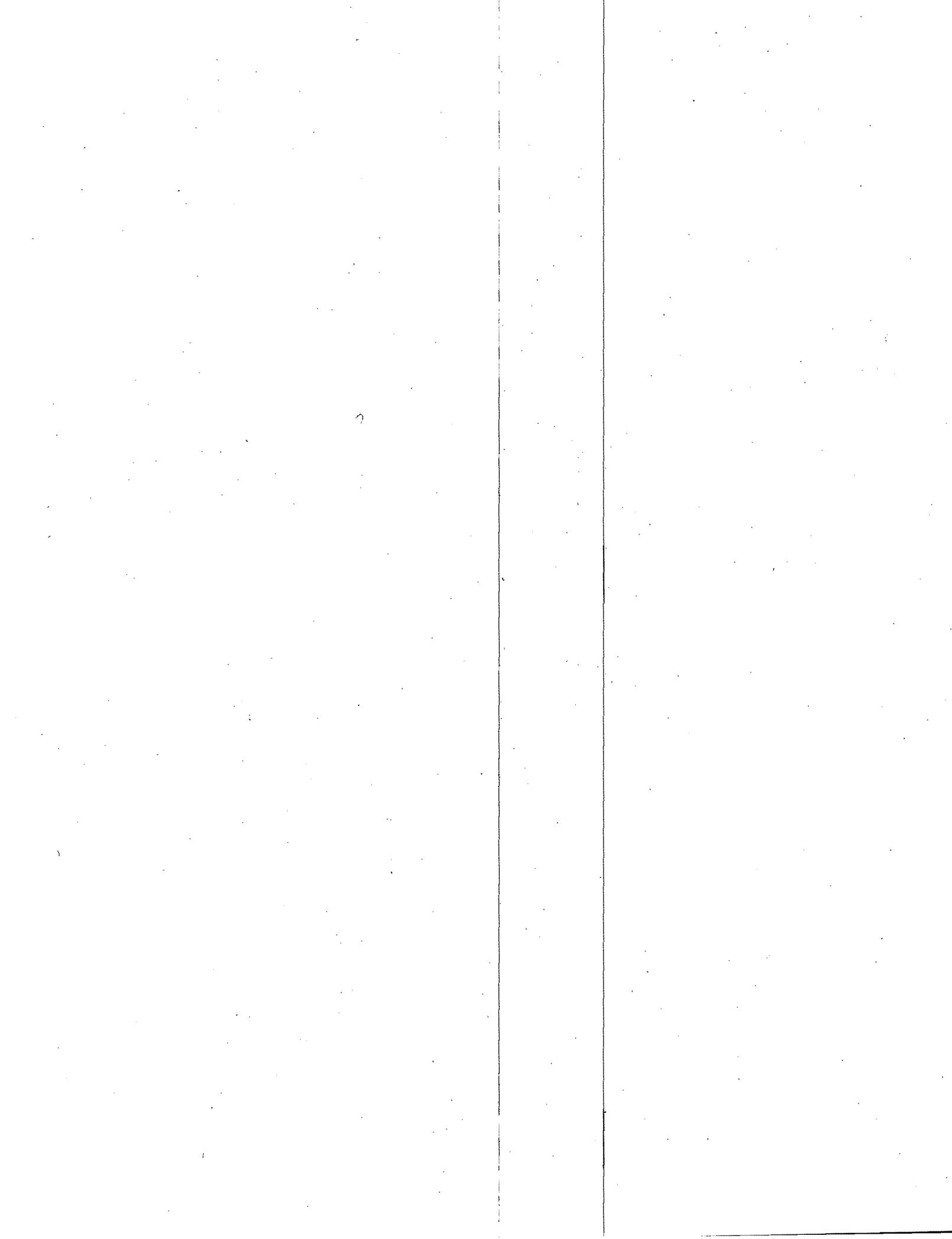
FACILITY NAME:	WILLIAMS REFINERY		
LOCATION MAP:	START DATE & TIME:	3/15/99	
	COMP. DATE & TIME:		
	LOGGED BY:	Kylie McCord	
	DRILLER:	Tri State Testing	
	DRILLING METHOD:	Auger	
	ELEV (MSL):	T.D. (MSL):	71'
COMMENTS: NO SAMPLING INSTALLED 6" DIA. RW. - 40' SCREEN, 21' RISER			

TN FAC. ID# 9-791214 WELL #: RW-3(E) 22
PROJECT #: Standard Boring Log
State of Tennessee
Underground Storage Tank Division
Department of Environment and Conservation

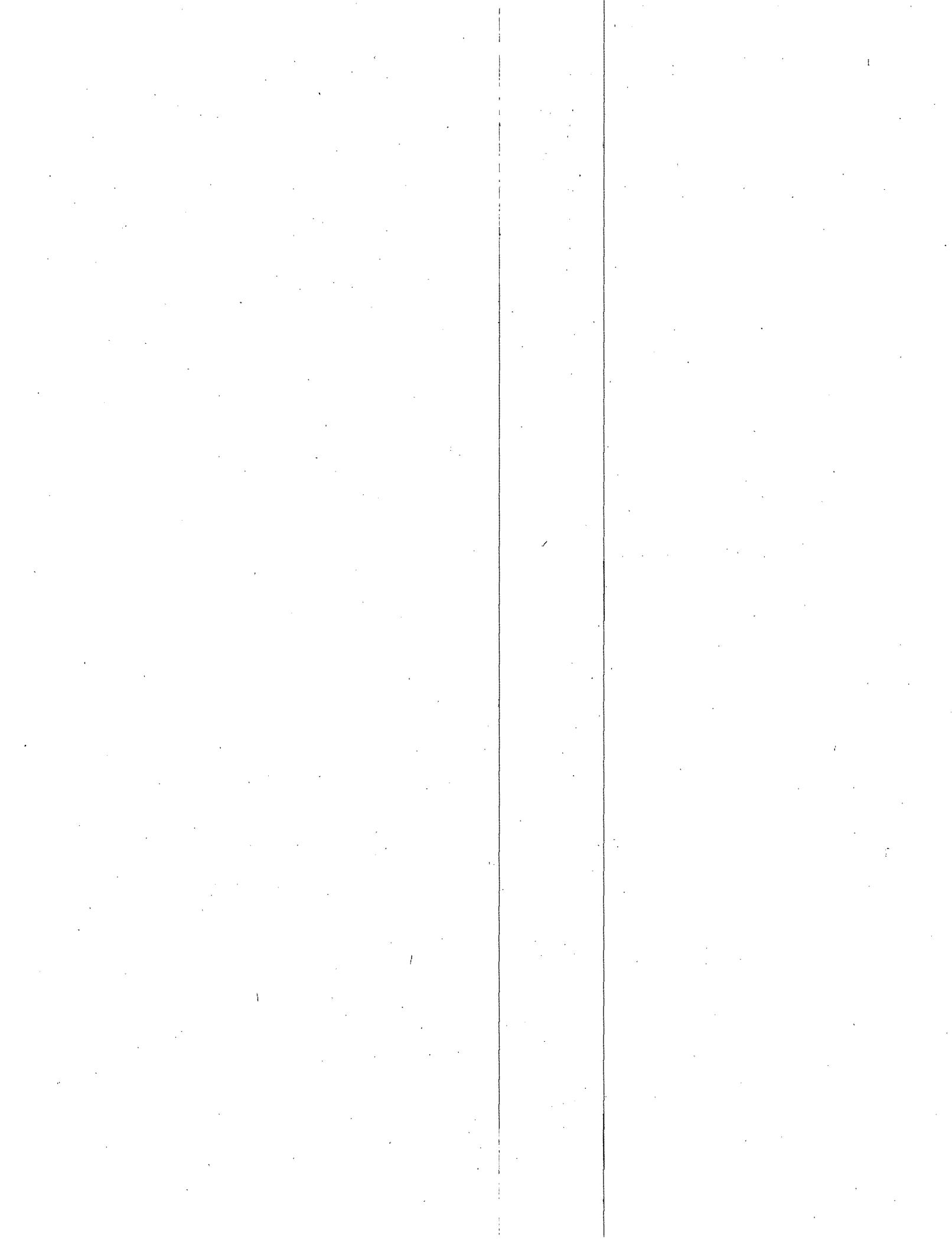
MSL	COMPLETION DIAGRAM BOREHOLE DIAMETER: (2.25")	TEST MATERIALS	PENETRATION RATE	DEPTH	GRAPHIC LITHOLOGY	SAMPLES & CORES			DESCRIPTION (Color, Texture, Structure, etc.)
						#	TYPE	NO. PER INCH	
				0	0 0 0 0 0 0 0 0 0				(0-1') GRAVEL
				1					(1-4') DAMP, BROWN, VERY SILTY - CLAY
				2					(A-6') BECOMING LESS SILTY
				3					(6-11') DAMP GRAY-BROWN. SLIGHTLY SILTY CLAY
				4					(11-20') GRAY-GREEN SLIGHTLY SILTY CLAY w/ ROCK FRAGMENTS.
				5					HYDRO CARBON ODOR
				6					(20-27') GRAY GREEN SL. SILTY CLAY w/ ROCK FRAGMENTS.
				7					HYDRO CARBON ODOR
				8					(27'-30') BLACK ASPHALTIC MAT'L. INTERMIXED



FACILITY NAME: WILLIAMS REFINERY						TH FAC ID#:	9-791214	WELL #:	RU-3 (R)	DRILLER:	23
COMPLETION DIAMETER						INCHES	FT.	SAMPLES & CORES			
BOREHOLE DIAMETER:								ON	TYPE	INT.	ANAL.
NO.						DEPTH		GRAPHIC LITHOLOGY			DESCRIPTION (Color, Texture, Structure, etc.)
						30					(30-34') COLOR CHANGE TO LT. BROWN
						35					(34-38') MOIST TO WET LT. TAN TO BROWN SL. ODOR SILTY CLAY
						40					(38-45') LT. TAN TO WHITE SAND, SL. SILTY
						45					(45-61') VERY FEW CUTTINGS MUD COMING UP AUGER @ 61'
						50					
						55					
						60					
						65					



FACILITY NAME: WILLIAMS REFINERY					TN FAC. ID#:	9-791214	WELL #:	RW-2(2)	
COMMENTS: TERMINATED BORING @ 71'									
NO.	COMPLETION DIAGRAM		PENETRATION RATE	DEPTH	GRAPHIC LITHOLOGY	8	SAMPLES & CORES		DESCRIPTION: (Color, Texture, Structure, etc.)
	BOREHOLE DIAMETER						TYPE	# REF.	
				65					
				70					BORING TERMINATED @ 71'
				75					
				80					
				85					
				90					
				95					
				100					





MEMPHIS AND SHELBY COUNTY HEALTH DEPARTMENT

YVONNE S. MADLOCK
Director

JOHN B. KIRKLEY, M.D.
Interim Health Officer

DR. W. W. HERENTON
Mayor of Memphis

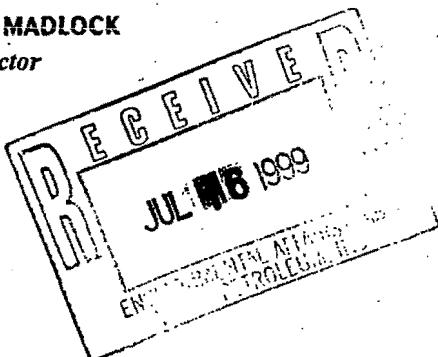


JIM ROUT

Mayor of Shelby County

July 8, 1999

Ms. Joyce Yeager
2389 Riverport Road
Memphis, TN 38109



**RE: EMERGENCY CONSTRUCTION OF RECOVERY WELL(S) AT: 2389 Riverport Road
(Mapco Williams Mid-South Refinery)
Permit #99-131 B-11, RW-7**

Dear Ms. Yeager:

This letter is to inform you that a construction permit has been issued to your selected well driller, approving the above referenced recovery well(s). We appreciate the cooperation you have given the Health Department during the application review process. Please be reminded of the following requirements:

1. The Health Department is to be notified when construction of the well(s) begins.
2. The Health Department is to be notified if the well driller violates any of the conditions for which the permit was issued.
3. The Health Department is to be notified for prior approval of any changes in plans for construction such as a well site location, number of wells needed, well usage such as converting a recovery well to a monitoring well, or in the well driller initially selected to do the work.
4. Well logs on the well(s) are to be submitted to this Office within thirty (30) days of work completion.

Once again, your cooperation in this matter will be appreciated. Should you have any questions or need additional information, you can contact Mr. Greg Parker at (901) 544-7741.

Sincerely,

J. Carter S. Gray, Manager
POLLUTION CONTROL SECTION

GP:JCSG:mpc

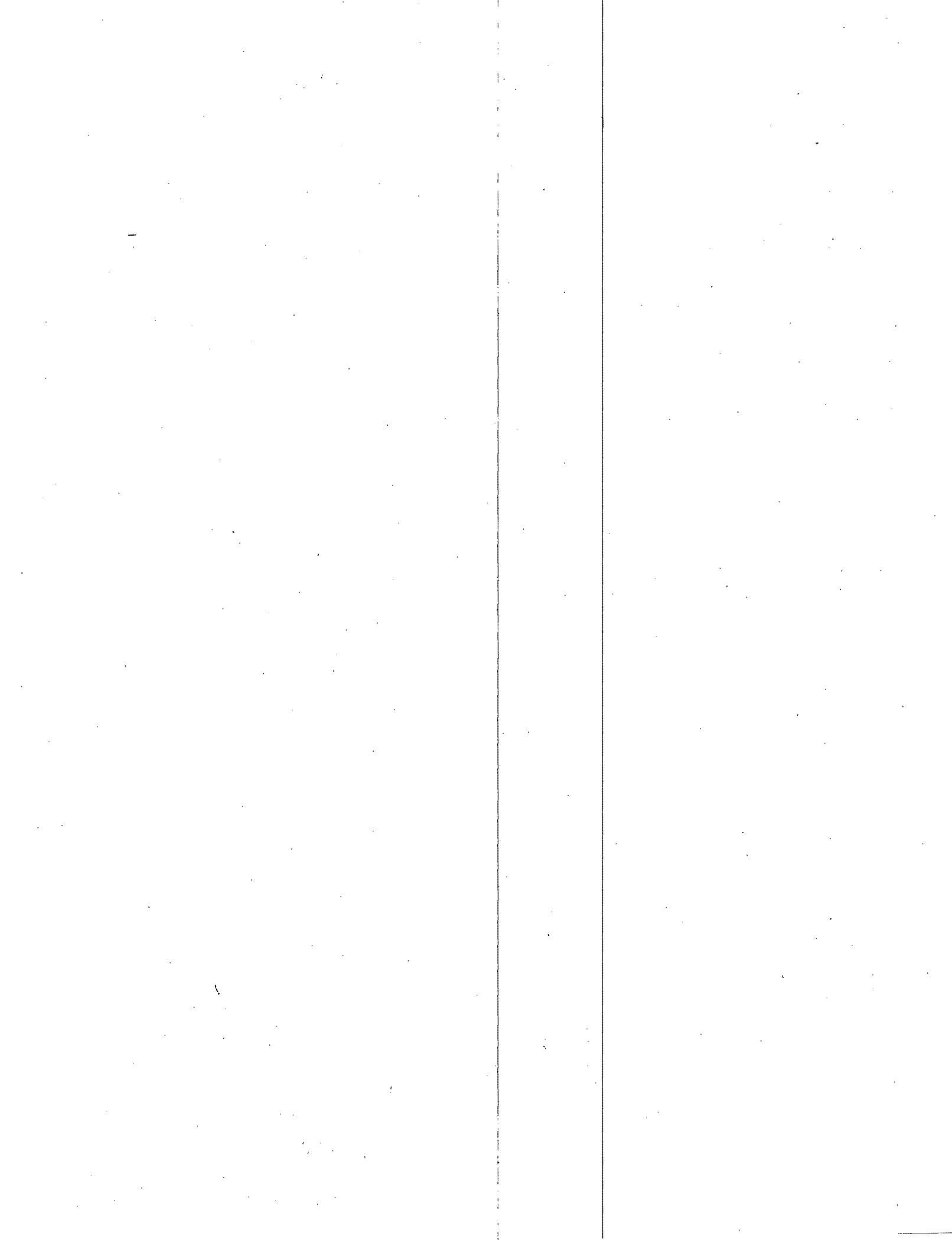
Enclosure

Mission

To promote, protect and improve the health and environment of all Shelby County residents.

814 JEFFERSON AVENUE, MEMPHIS, TENNESSEE 38105

Phone (901) 544-7600



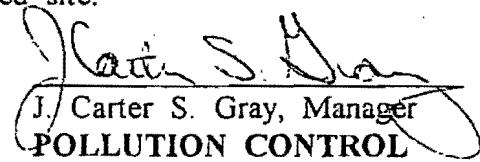
**MEMPHIS AND SHELBY COUNTY HEALTH DEPARTMENT
WATER QUALITY BRANCH
RECOVERY WELL CONSTRUCTION PERMIT**

WELL DRILLING COMPANY GEOTEK DRILLING COMPANY, INC.
ADDRESS 8321 Oak Ridge Highway Knoxville, TN 37931
DATE ISSUED 12/28/98 EXPIRATION DATE 3/28/99 PERMIT NUMBER 99-131
DESCRIPTION OF WORK Construction of Recovery Wells at 2389 Riverport Road
EMERGENCY PERMIT Mapco Williams Mid-South Refinery B-11, RW-7

This permit is issued based on the signed commitment of the driller and the owner of said well that all work performed at this site will be in full compliance with the requirements outlined in the Shelby County Well Construction Code or as directed by the Water Quality Branch of the Memphis and Shelby County Health Department. Any deviation of the approved conditions outlined on this permit by the well drilling company will void this permit immediately.

CONDITIONS :

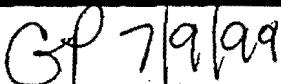
1. Any water used in drilling these recovery wells must be obtained from a potable source.
2. A protective device must be placed over the well opening by the well driller and it will be the owners responsibility to maintain the integrity of this device.
3. All applicable fees must be paid to the Memphis and Shelby County Health Department.
4. An annual fee of twenty (\$20.00) dollars per well will be assessed for all active recovery wells at this location with the maximum annual fee not to exceed one hundred (\$100.00) per site.
5. The Water Quality Branch shall be notified at least twenty-four (24) hours before construction of the recovery wells.
6. Within thirty (30) days after completion of the recovery wells a copy of the well logs must be submitted to the Water Quality Branch.
7. A copy of the sample results must be submitted to this office within sixty (60) days of completion of the recovery wells.
8. All requirements outlined in the Shelby County Well Construction Code shall be complied with by the driller.
9. The Water Quality Branch will be notified should the number of recovery wells change from the number permitted.
10. Abandoned wells shall be properly sealed as required by the Health Department.
11. This permit is valid only for construction at the above referenced site.

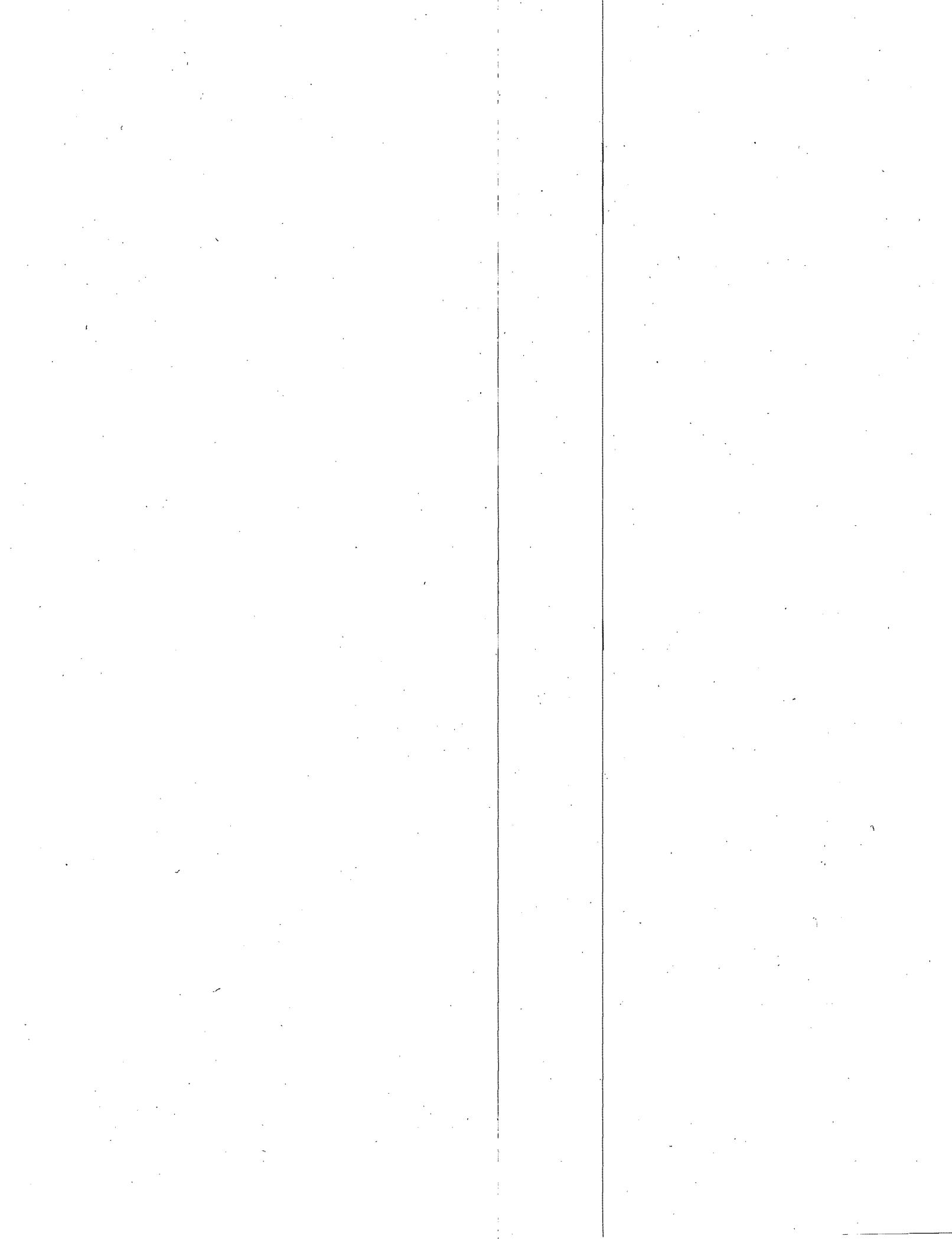

J. Carter S. Gray, Manager
POLLUTION CONTROL

No authority is granted by this permit to construct, operate or maintain any well in violation of any law, statute, code, ordinance, rule or regulation of Memphis and Shelby County, Tennessee.

NON TRANSFERABLE

POST OR FILE AT INSTALLATION ADDRESS

 GP 7/9/99





IT CORPORATION
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Drilling Log

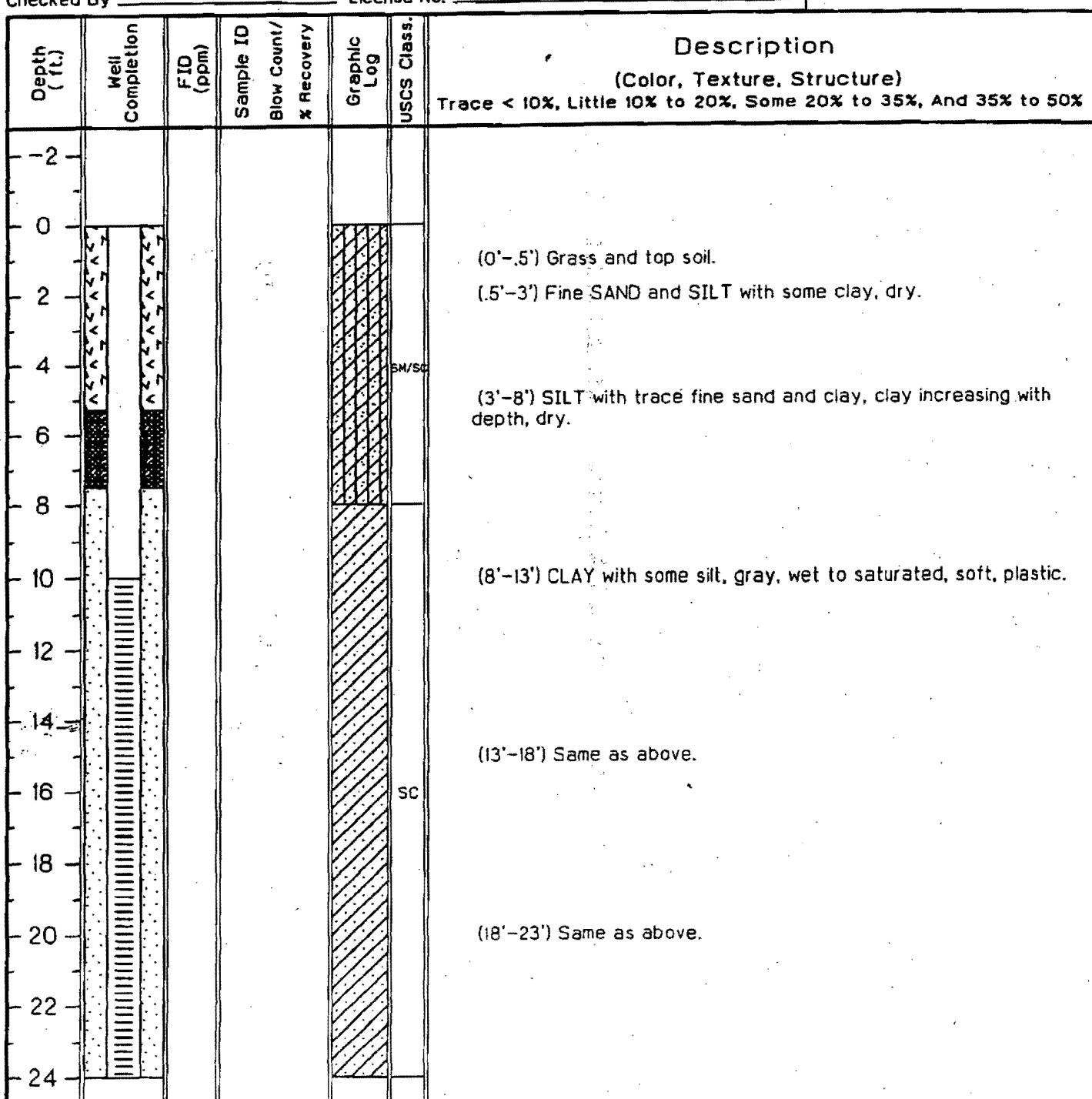
Monitoring Well OW-29R

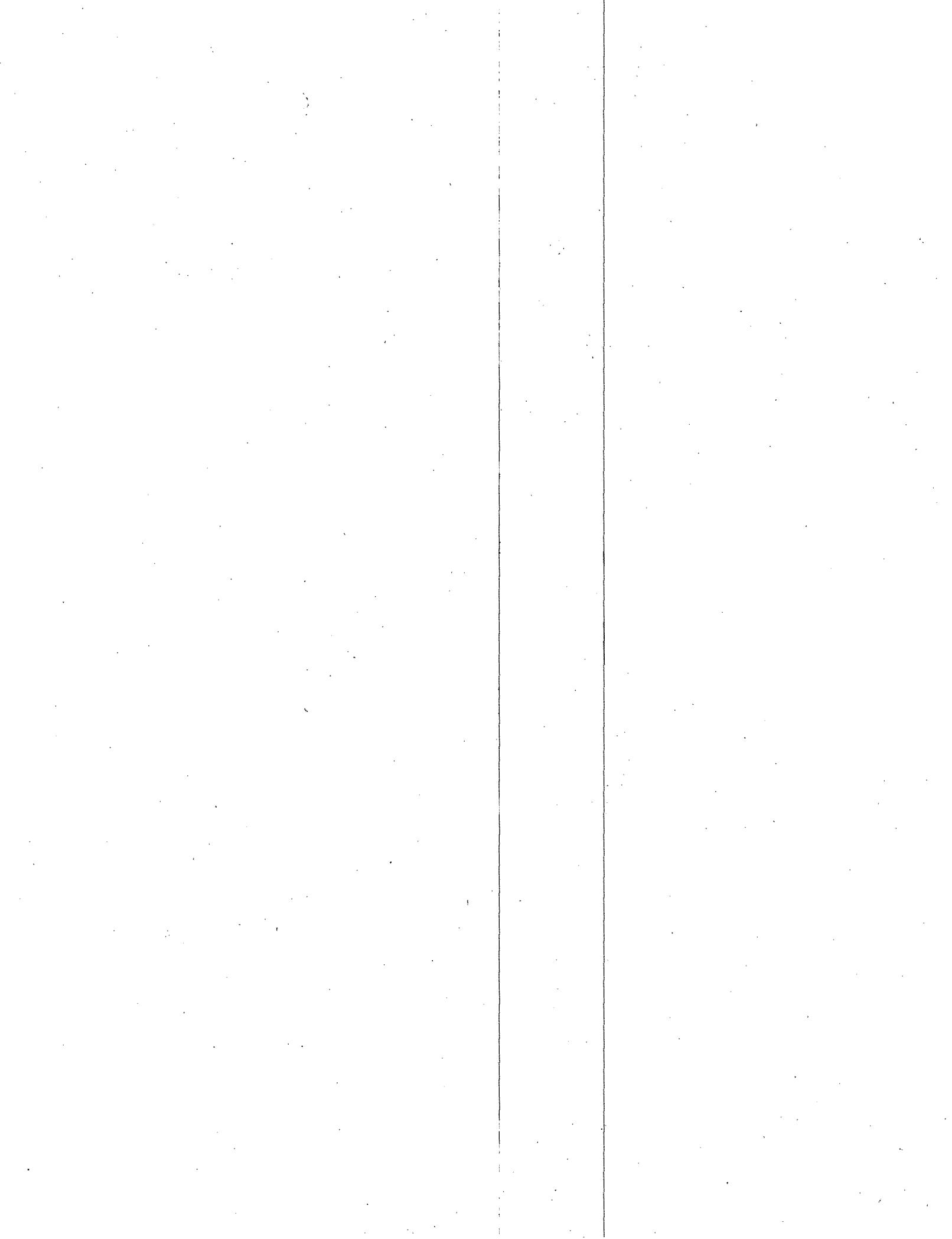
Project Williams Refinery Owner Williams Refining, L.L.C.
 Location 543 West Mallory Ave., Memphis, TN Proj. No. 799453
 Surface Elev. Total Hole Depth 60 ft. Diameter 8.25 in.
 Top of Casing Water Level Initial Static
 Screen: Dia 2 in. Length 50 ft. Type/Size 0.01 in.
 Casing: Dia 2 in. Length 10 ft. Type Schedule 40 PVC
 Fill Material Washed Silica Sand Rig/Core CME
 Drill Co. Tri State Method Hollow Stem Auger
 Driller Log By William Connolly Date 09/23/99 Permit #
 Checked By License No.

See Site Map
For Boring Location

COMMENTS:

□ denotes 0% to 25% sample recovery;
▨ denotes 25% to 50% sample recovery;
▨▨ denotes 50% to 75% sample recovery;
▨▨▨ denotes 75% to 100% sample recovery.
 No samples were collected during the installation of OW-29R. Lithological classification was obtained from auger cuttings.







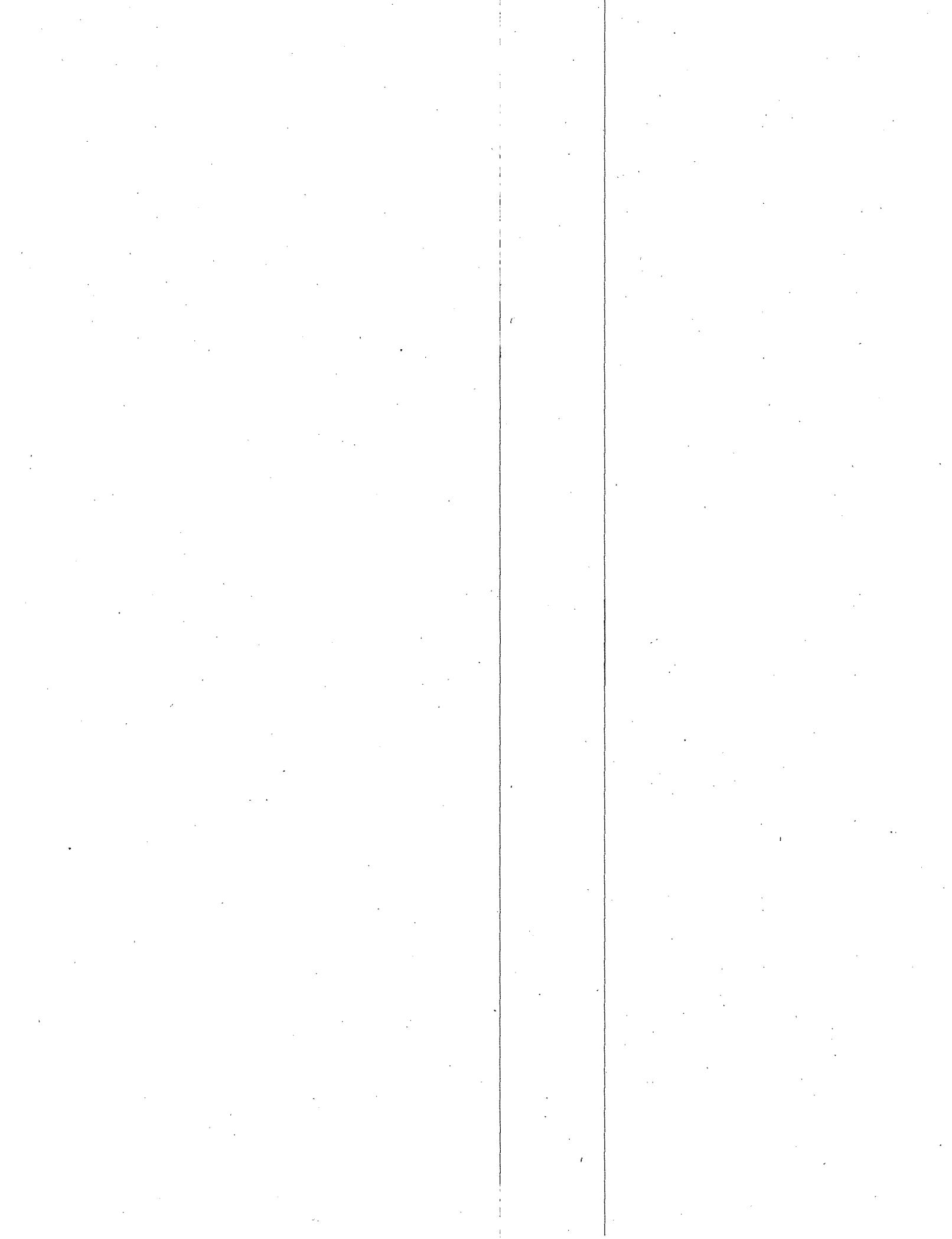
IT CORPORATION
A Member of the IT Group

Drilling Log

Monitoring Well OW-29R

Project Williams Refinery Owner Williams Refining, L.L.C.
Location 543 West Mallory Ave., Memphis, TN Proj. No. 799453

Depth (ft.)	Well Completion	FID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure)
-24							Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-26							(23'-28') Same as above, increasing stiffness with depth, wet to saturated.
-28							
-30							(28'-33') Same as above.
-32							
-34							
-36							
-38							(33'-38') Same as above, minimal soil produced during the 5' auger flight.
-40							
-42							
-44							
-46							(43'-48') Same as above.
-48							
-50							(48'-53') Same as above.
-52							
-54							
-56							(53'-58') Same as above.





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Drilling Log

Monitoring Well OW-29R

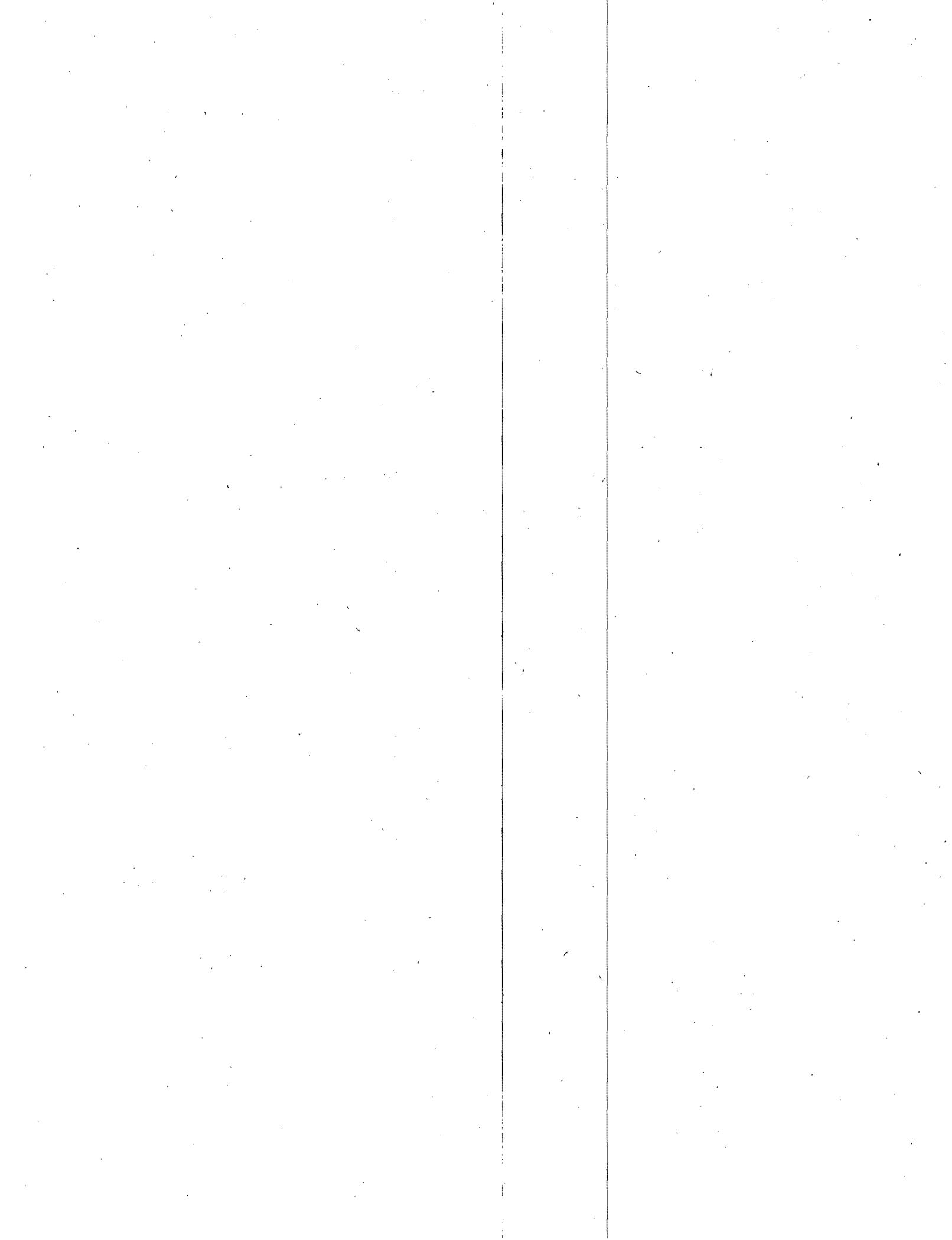
Project Williams Refinery

Location 543 West Mallory Ave., Memphis, TN

Owner Williams Refining, L.L.C.

Proj. No. 799453

Depth (ft.)	Well Completion	F10 (ppm)	Sample ID	Blow Count/ x Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure)	
							Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
56								
58						SM/SC	(58'-60') Same as above, clay, some silt and fine sand, wet, plastic.	
60							Boring terminated at 60' BLS	
62								
64								
66								
68								
70								
72								
74								
76								
78								
80								
82								
84								
86								
88								





IT CORPORATION
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Drilling Log

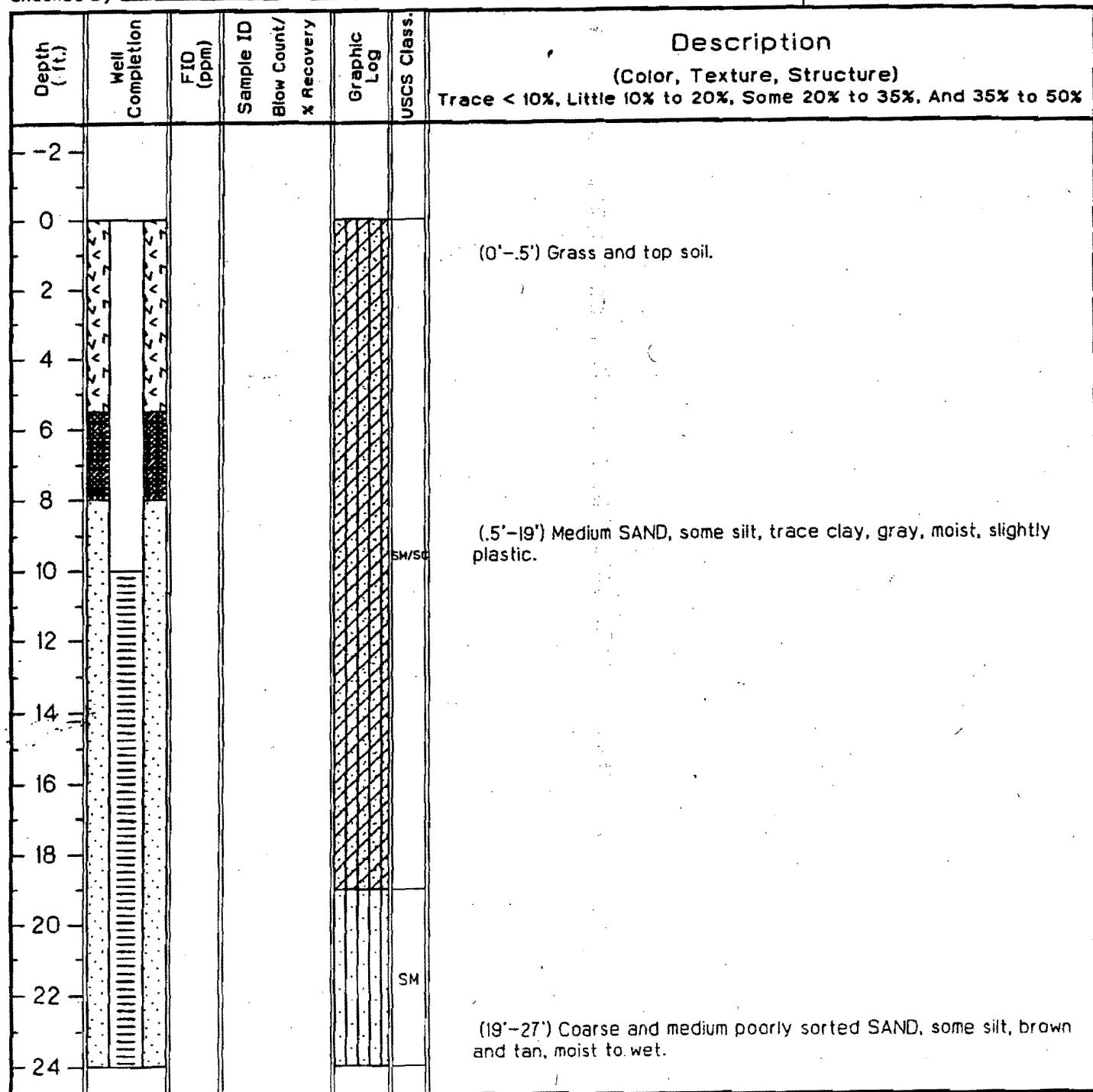
Monitoring Well OW-34R

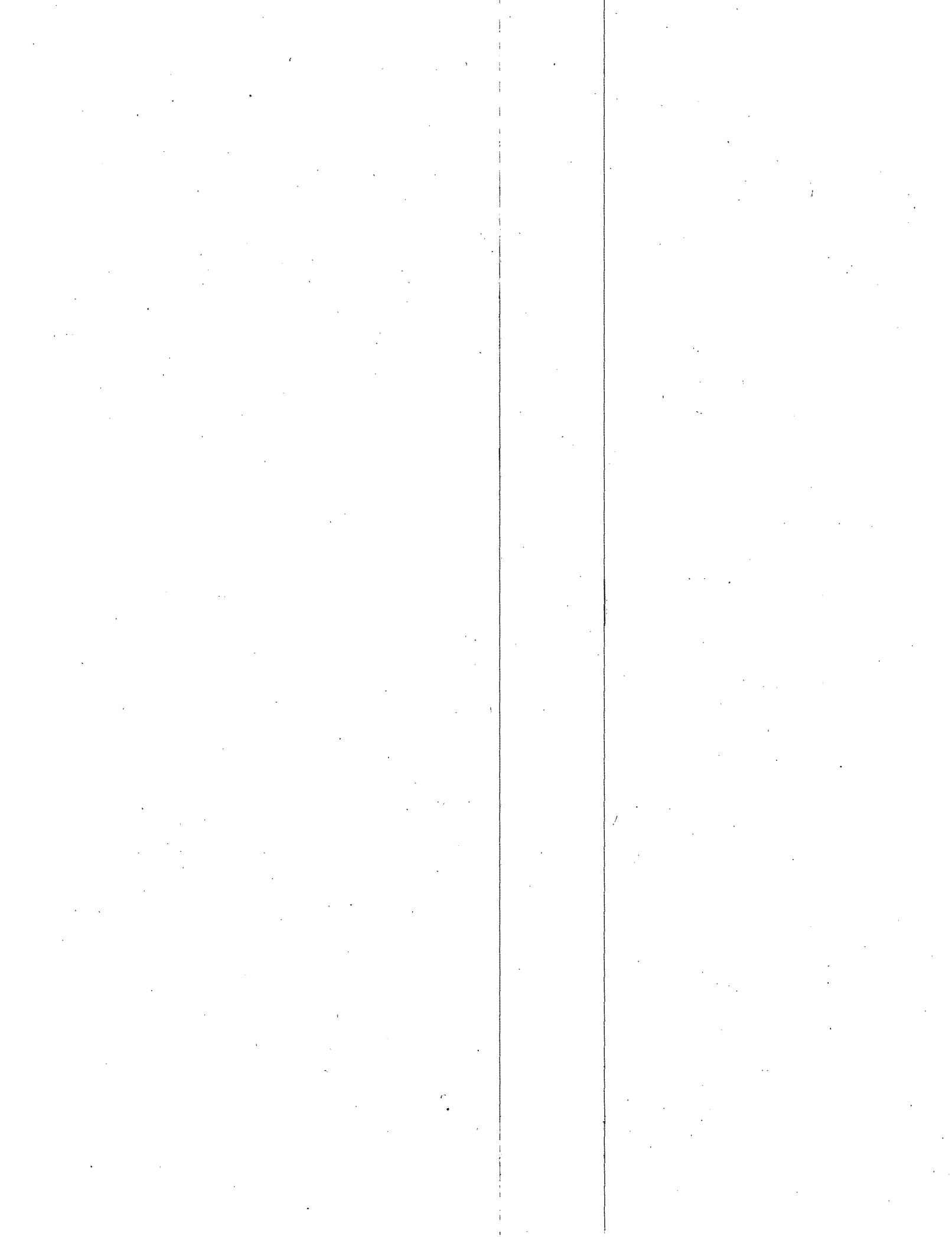
Project Williams Refinery Owner Williams Refining, L.L.C.
 Location 543 West Mallory Ave., Memphis, TN Proj. No. 799453
 Surface Elev. _____ Total Hole Depth 35 ft. Diameter 8.25 in.
 Top of Casing _____ Water Level Initial _____ Static _____
 Screen: Dia 2 in. Length 25 ft. Type/Size 0.01 in.
 Casing: Dia 2 in. Length 10 ft. Type Schedule 40 PVC
 Fill Material Washed Silica Sand Rig/Core CME
 Drill Co. Tri State Method Hollow Stem Auger
 Driller _____ Log By William Connolly Date 09/23/99 Permit # _____
 Checked By _____ License No. _____

See Site Map
For Boring Location

COMMENTS:

I denotes 0% to 25% sample recovery;
 II denotes 25% to 50% sample recovery;
 III denotes 50% to 75% sample recovery;
 IV denotes 75% to 100% sample recovery.
 No samples were collected during the installation of OW-34R. Lithological classification was obtained from auger cuttings.







IT CORPORATION
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Drilling Log

Monitoring Well OW-34R

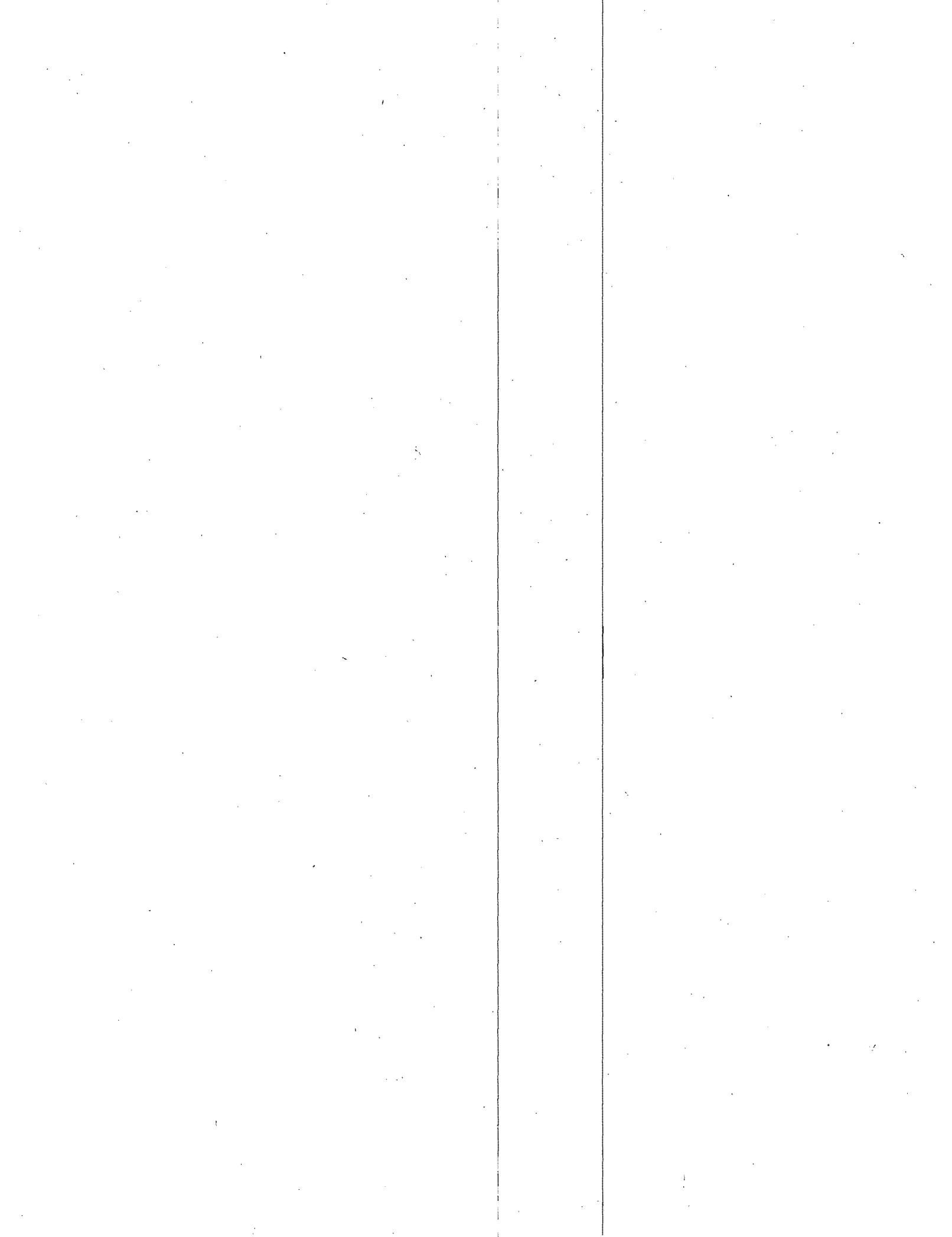
Project Williams Refinery

Location 543 West Mallory Ave., Memphis, TN

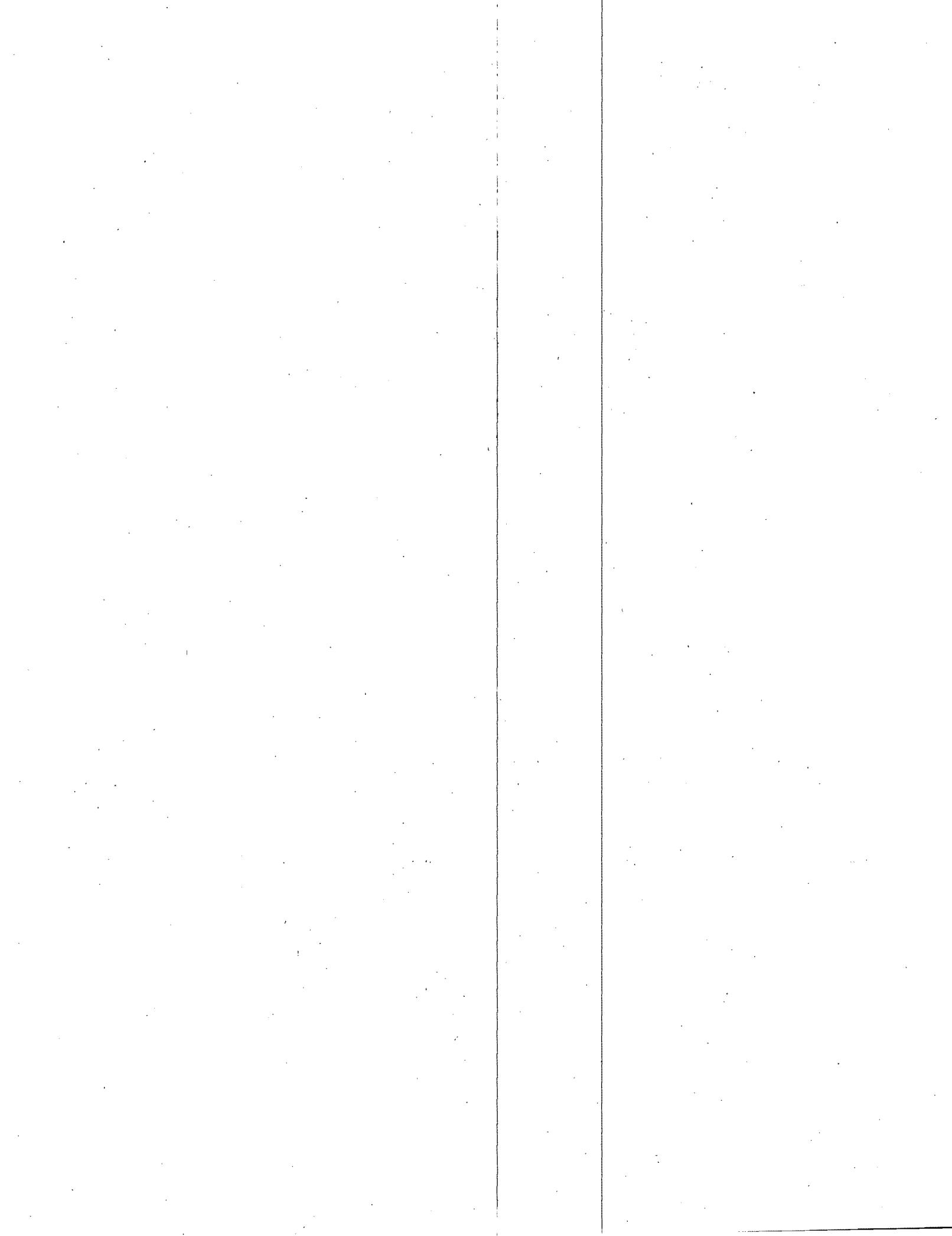
Owner Williams Refining, L.L.C.

Proj. No. 799453

Depth (ft.)	Well Completion	F10 (ppm)	Sample ID	Blow Count/ X Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure)	
							Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%	
24								
26								
28							(27'-28') Same as above, saturated.	
30						SM		
32								
34								
35							Boring terminated at 35' BLS	
36								
38								
40								
42								
44								
46								
48								
50								
52								
54								
56								

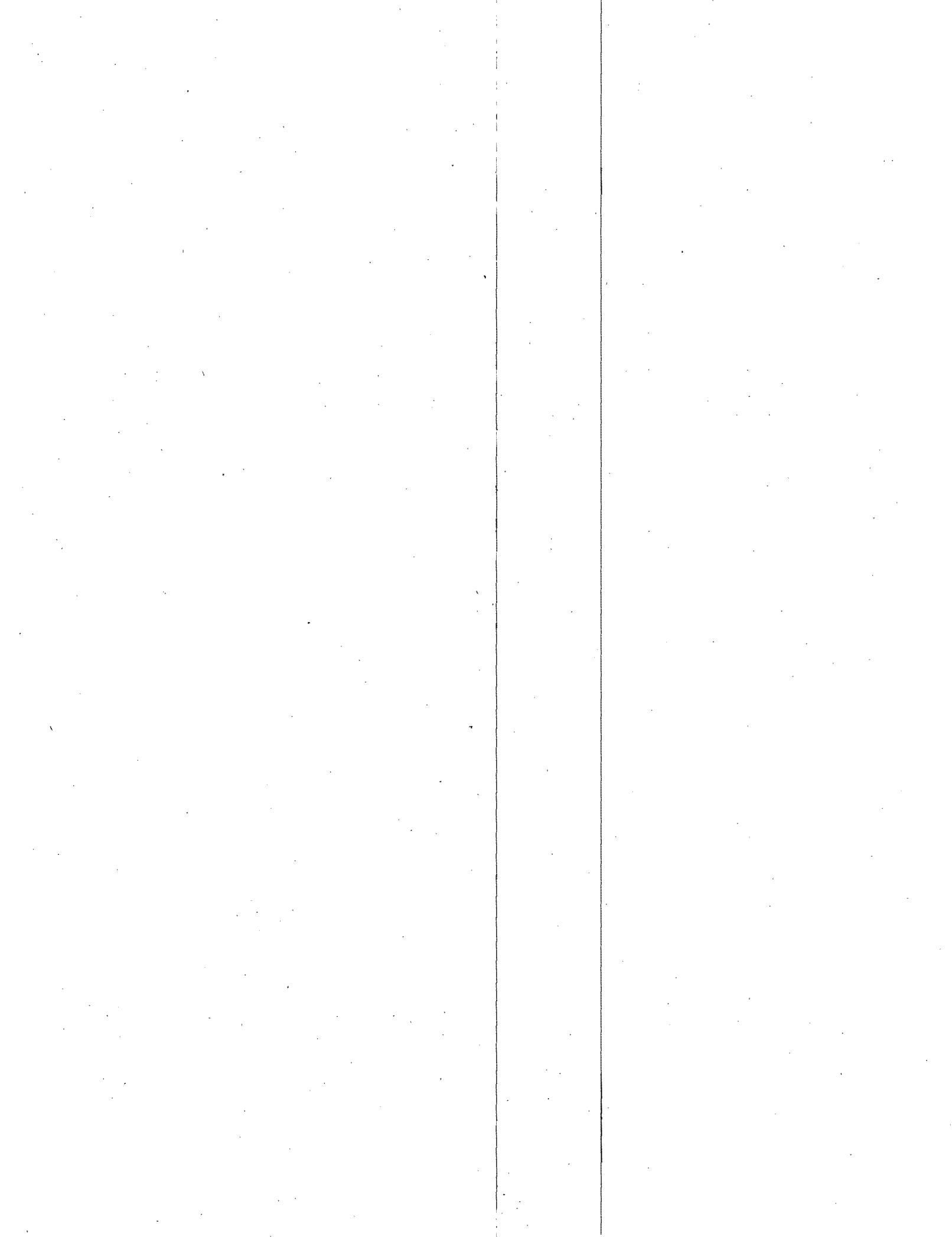


APPENDIX
G



APPENDIX G

WASTE DISPOSAL DOCUMENTATION





ENVIRONMENTAL TESTING & CONSULTING, INC.

2924 Walnut Grove Road • Memphis, TN 38111 • (901) 327-2750 • FAX (901) 327-6334

Founded 1972

October 12, 1999

Mr. Bruce Shaw
IT Corporation
2606 Corporate Avenue
Suite 191
Memphis, TN 38132

Ref: Analytical Testing
ETC Order # 9909675
Project Description Williams Refinery
543 West Mallory-Memphis, TN
Project # 799453

The above referenced project has been analyzed per your instructions. The analyses were performed in accordance with Standard Methods 17th/18th Edition; The Solid Waste Manual SW-846; EPA Methods for the Analysis of Water and Wastes and/or 40 CFR part 136.

The results are shown on the attached analysis sheet(s).

Please do not hesitate to contact our office if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Nathan A. Pera, IV".

Nathan A. Pera, IV
Chief Executive Officer

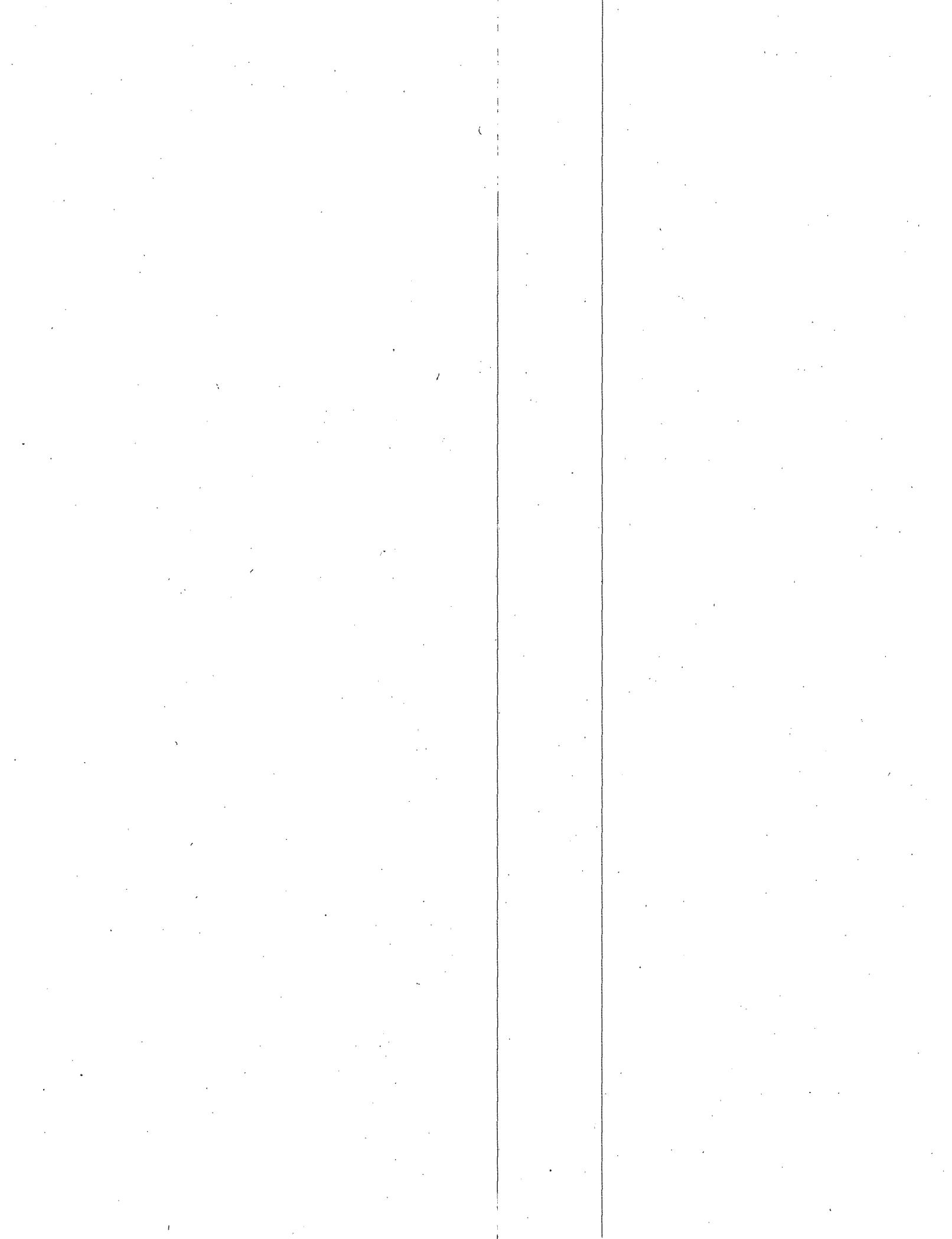
rt.
Attachment

ITCORP_MEM

Certifications

Tennessee	#TN02027
Arkansas	
Alabama	#40730
Kentucky	#90047
North Carolina	#415
South Carolina	#84002002

Mississippi	
Oklahoma	#9311
Virginia	#00106
Washington	#C248
US Army Corps of Engineers	



ENVIRONMENTAL TESTING & CONSULTING, INC.

2924 Walnut Grove Road - Memphis, TN 38111 - (901)327-2750

INORGANIC ANALYSIS DATA SHEETClient Name **IT Corporation**Project # **799453**

2606 Corporate Avenue
Suite 191
Memphis, TN 38132

Site ID Williams Refinery
543 West Mallory-Memphis, TN

Date Arrived 09/24/99

ETC Order Number 9909675

ETC Lab ID **9909675-01****Sample ID: OW-29(R)Comp**

Matrix :SOIL

Sample Date :09/23/99

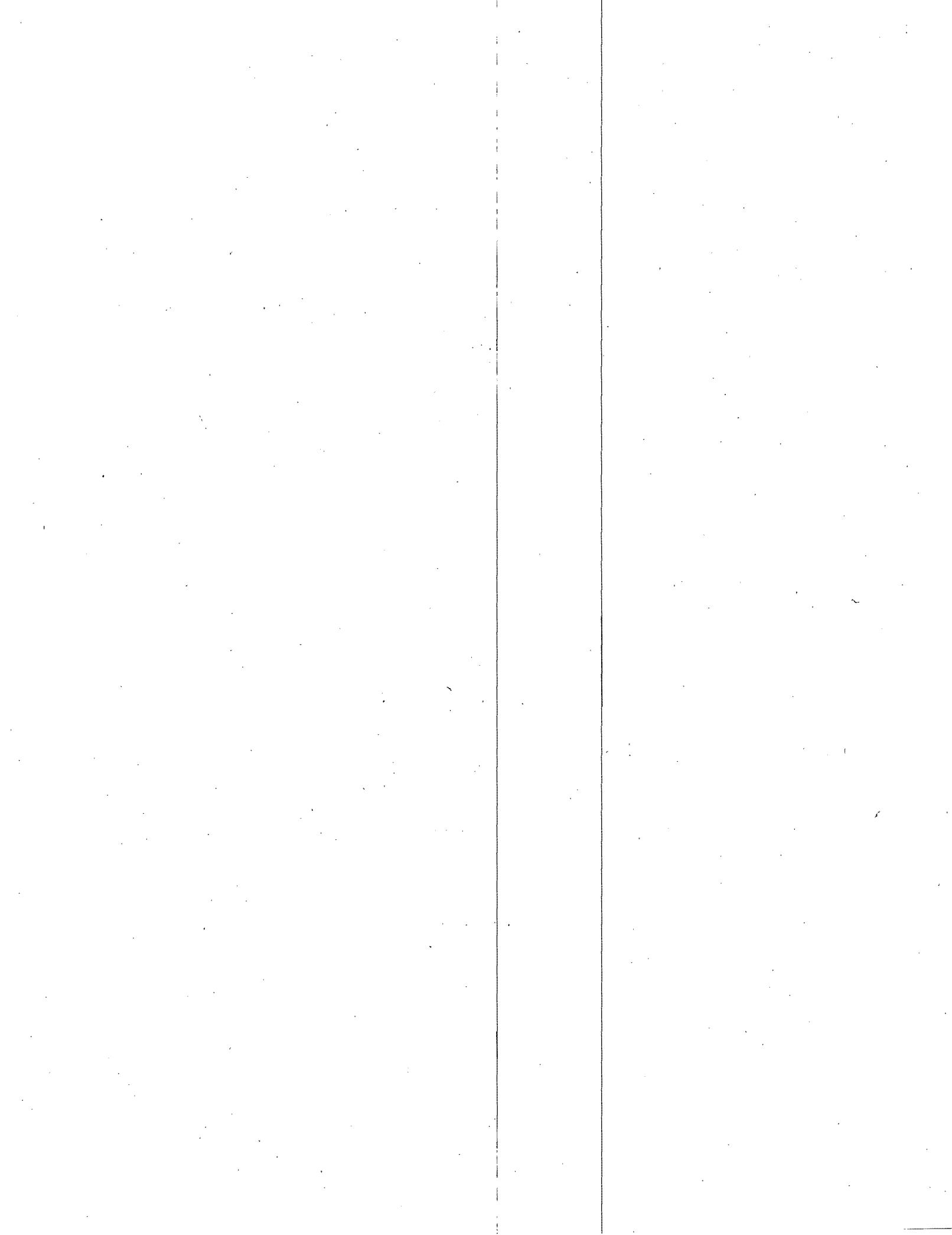
TEST	RESULT	UNITS	DETECTION LIMIT	TIME ANALYZED	DATE ANALYZED BY	METHOD
Ignitability/Flashpoint	>96	oC		1005	10/04/99	GD 1010

ETC Lab ID **9909675-02****Sample ID: OW-34(R)Comp**

Matrix :SOIL

Sample Date :09/23/99

TEST	RESULT	UNITS	DETECTION LIMIT	TIME ANALYZED	DATE ANALYZED BY	METHOD
Ignitability/Flashpoint	>96	oC		1005	10/04/99	GD 1010



ENVIRONMENTAL TESTING & CONSULTING, INC.

2924 Walnut Grove Road - Memphis, TN 38111 - (901)327-2750

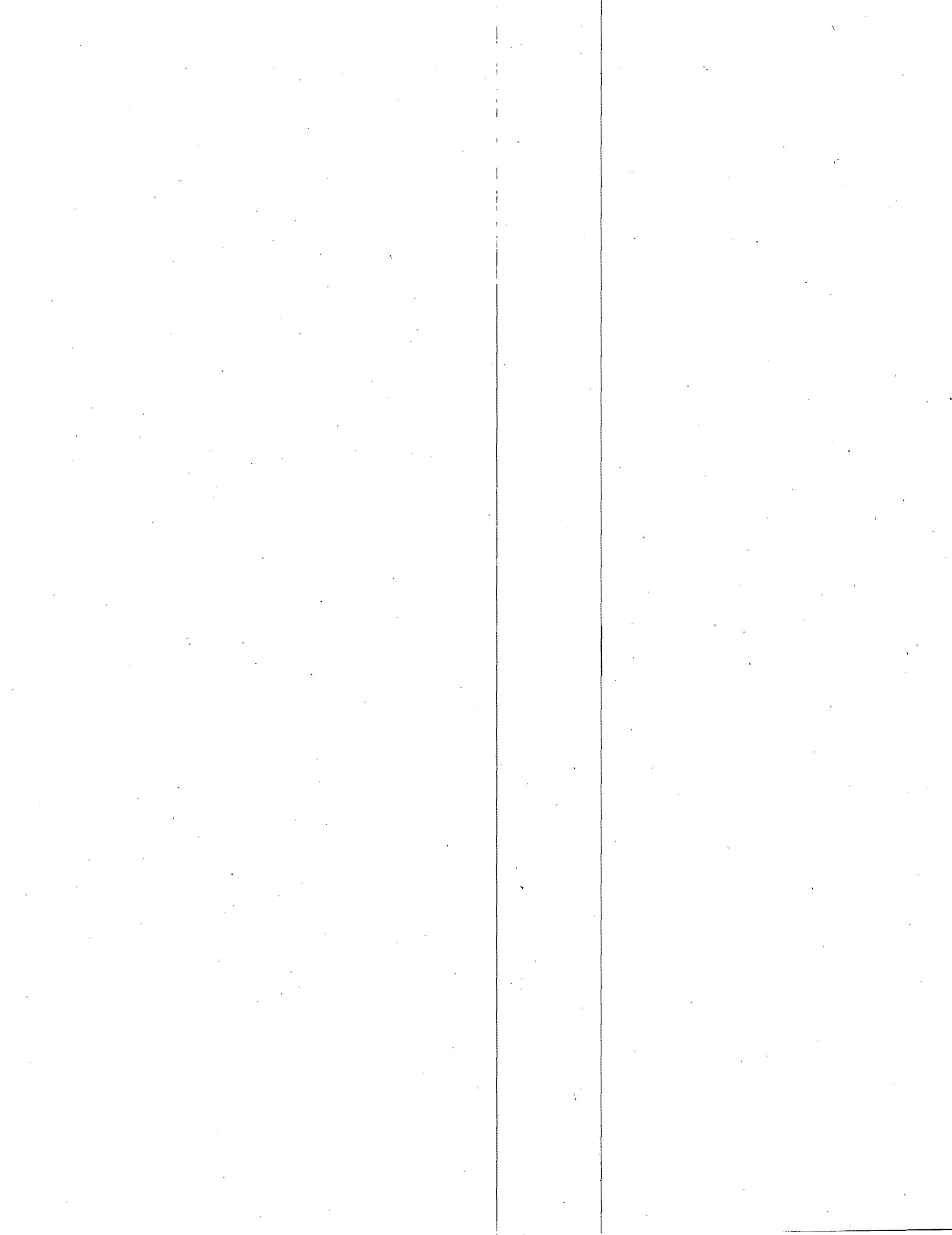
ORGANIC ANALYSIS DATA SHEETClient Name **IT Corporation**Project # **799453**

FID #

**2606 Corporate Avenue
Suite 191
Memphis, TN 38132**Site ID **Williams Refinery
543 West Mallory-Memphis, TN**Date Arrived **09/24/99**ETC Order Number **9909675**ETC Lab ID **9909675-01****Sample ID: OW-29(R)Comp**Matrix :**SOIL**Sample Date :**09/23/99**

TEST	RESULT	UNITS	DETECTION LIMIT	DATE EXTRACTED	DATE ANALYZED	BY	METHOD
Aromatic Volatile Organics							8021B
Benzene	ND	ug/Kg	100				
Toluene	ND	ug/Kg	500				
Ethyl Benzene	ND	ug/Kg	100				
Xylenes-m,p	ND	ug/Kg	200				
Xylenes-o	ND	ug/Kg	100				
Surrogate Standard							
SL - 4-Bromofluorobenzene	102			50	150		


LABORATORY MANAGER**ND - Not Detected**



ENVIRONMENTAL TESTING & CONSULTING, INC.
 2924 Walnut Grove Road - Memphis, TN 38111 - (901)327-2750
ORGANIC ANALYSIS DATA SHEET

Client Name **IT Corporation** Project # **799453**
 FID #

**2606 Corporate Avenue
 Suite 191
 Memphis, TN 38132**

Site ID **Williams Refinery
 543 West Mallory-Memphis, TN**

Date Arrived **09/24/99**

ETC Order Number **9909675**

ETC Lab ID **9909675-02**

Sample ID: OW-34(R)Comp

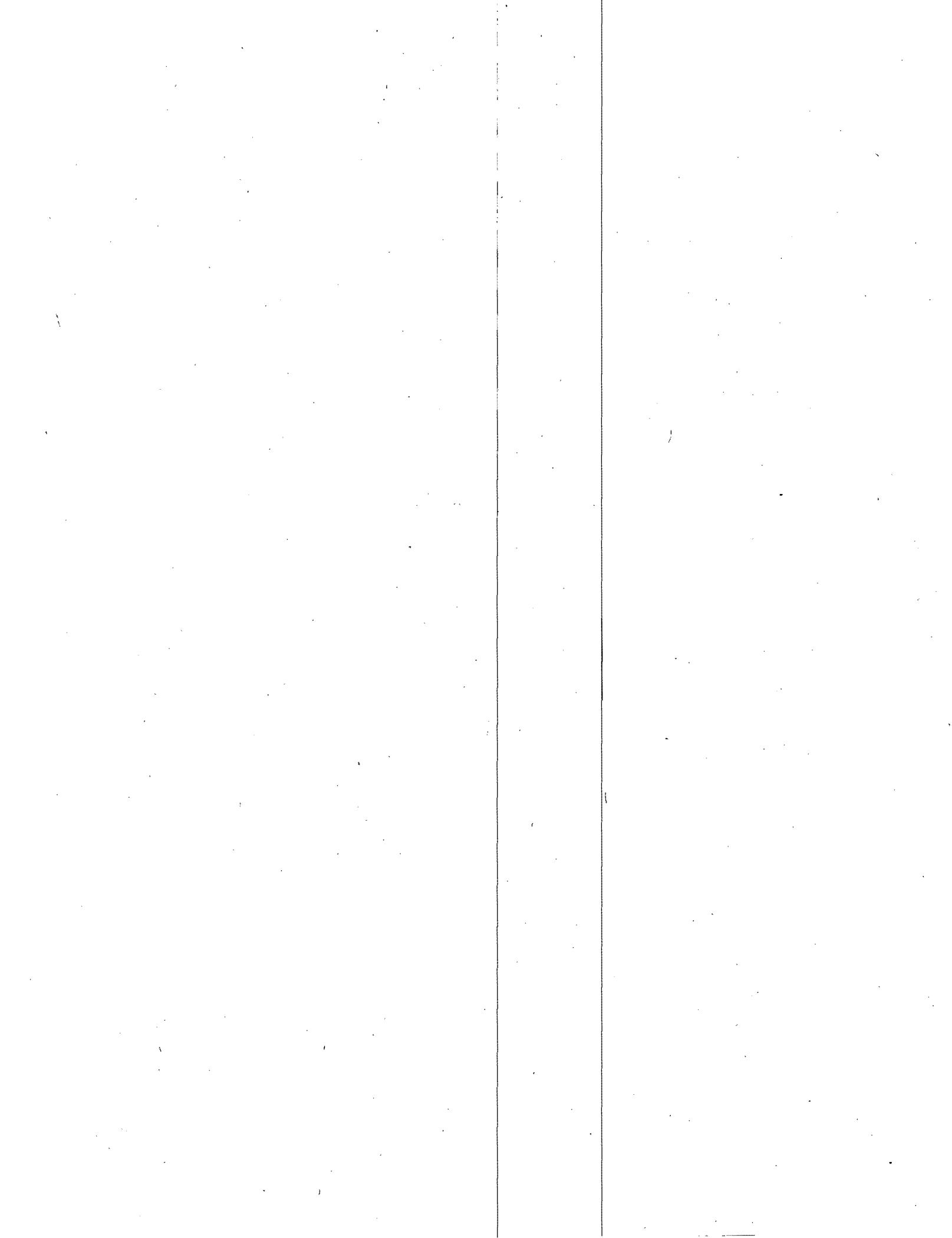
Matrix :**SOIL**

Sample Date :**09/23/99**

TEST	RESULT	UNITS	DETECTION LIMIT	DATE EXTRACTED	DATE ANALYZED	BY	METHOD
Aromatic Volatile Organics							8021B
Benzene	ND	ug/Kg	100				
Toluene	ND	ug/Kg	500				
Ethyl Benzene	ND	ug/Kg	100				
Xylenes-m,p	ND	ug/Kg	200				
Xylenes-o	ND	ug/Kg	100				
Surrogate Standard	% Recovery			QC Limits			
S1 - 4-Bromofluorobenzene	82			50	150		


LABORATORY MANAGER

ND - Not Detected



ENVIRONMENTAL TESTING & CONSULTING, INC.
2924 Walnut Grove Road - Memphis, TN 38111 - (901)327-2750
ORGANIC ANALYSIS DATA SHEET

Client Name **IT Corporation**

Project # **799453**
FID #

2606 Corporate Avenue

Suite 191

Memphis, TN 38132

Site ID **Williams Refinery**
543 West Mallory-Memphis, TN

Date Arrived **09/24/99**

ETC Order Number **9909675**

ETC Lab ID **9909675-01**

Matrix :**SOIL**

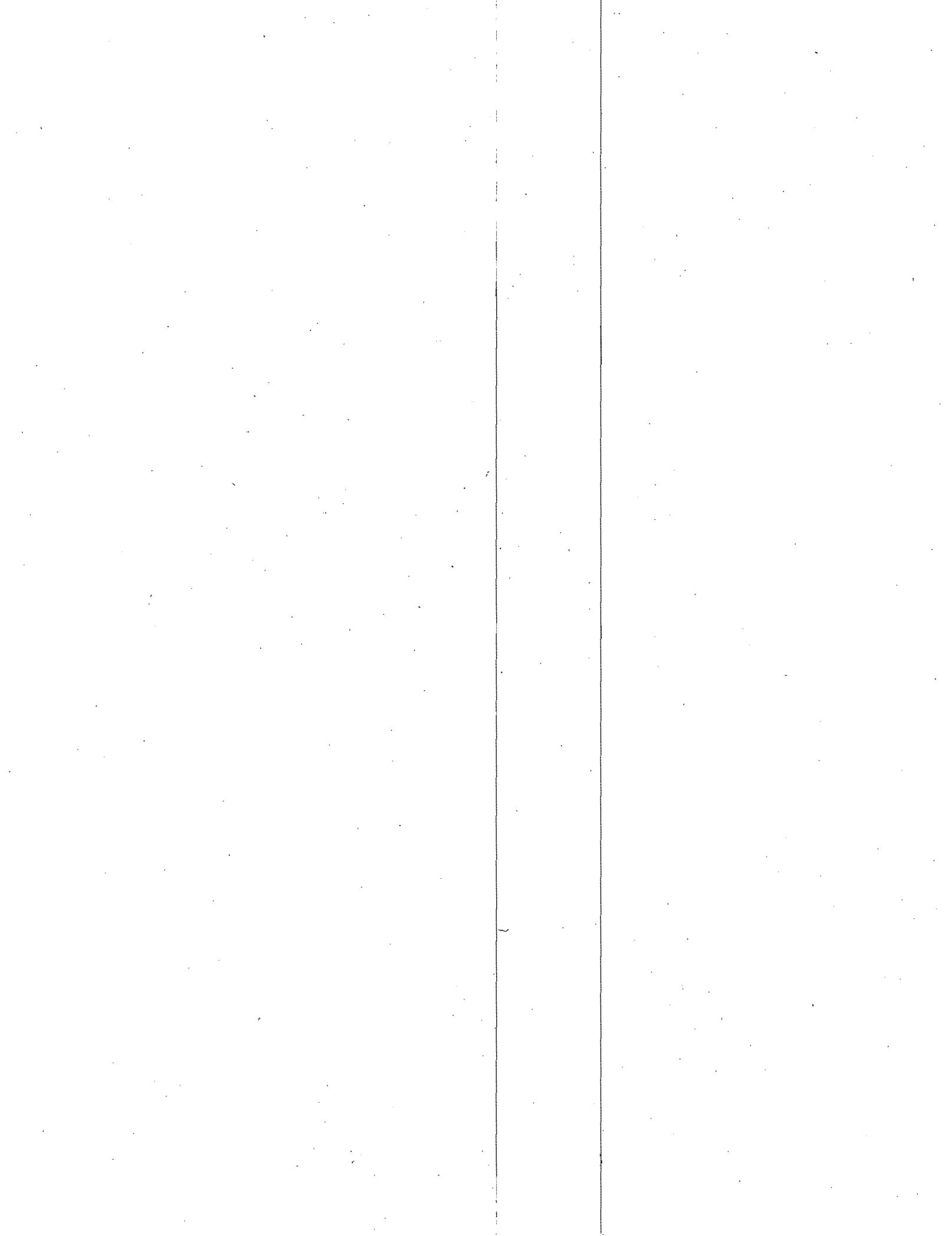
Sample ID: OW-29(R)Comp

Sample Date :**09/23/99**

TEST	RESULT	UNITS	DETECTION LIMIT	DATE EXTRACTED	DATE ANALYZED	BY	METHOD
TPH - Volatile Range							TN GRO
Gasoline Range Organics	ND	mg/Kg	10.0	09/29/99	10/01/99	EM	
<u>Surrogate Standard</u>							
S1 - 4-Bromofluorobenzene	103		50	150			


LABORATORY MANAGER

ND - Not Detected



ENVIRONMENTAL TESTING & CONSULTING, INC.

2924 Walnut Grove Road - Memphis, TN 38111 - (901)327-2750

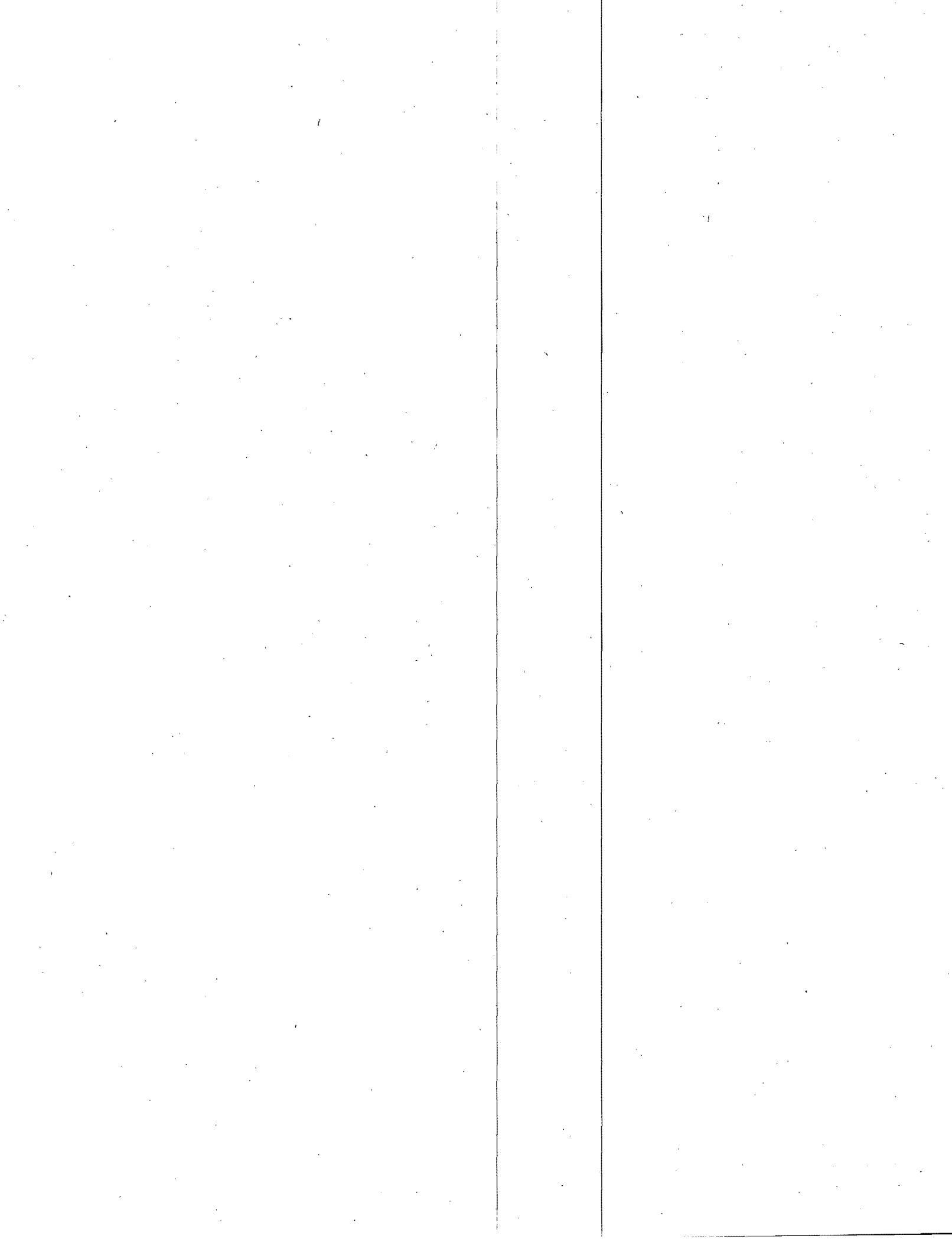
ORGANIC ANALYSIS DATA SHEETClient Name **IT Corporation**Project # **799453**

FID #

**2606 Corporate Avenue
Suite 191
Memphis, TN 38132**Site ID **Williams Refinery
543 West Mallory-Memphis, TN**Date Arrived **09/24/99**ETC Order Number **9909675**ETC Lab ID **9909675-02****Sample ID: OW-34(R)Comp**Matrix :**SOIL**Sample Date :**09/23/99**

TEST	RESULT	UNITS	DETECTION LIMIT	DATE EXTRACTED	DATE ANALYZED	BY	METHOD
FPH - Volatile Range							TN GRO
Gasoline Range Organics	ND	mg/Kg	10.0	09/29/99	10/01/99	EM	
Surrogate Standard							
S1 - 4-Bromofluorobenzene	84		50	150			


LABORATORY MANAGER**ND - Not Detected**



ENVIRONMENTAL TESTING & CONSULTING, INC.

2924 Walnut Grove Road - Memphis, TN 38111 - (901)327-2750

ORGANIC ANALYSIS DATA SHEET

Client Name **IT Corporation**

Project # **799453**
FID #

**2606 Corporate Avenue
Suite 191
Memphis, TN 38132**

Site ID **Williams Refinery
543 West Mallory-Memphis, TN**

Date Arrived **09/24/99**

ETC Order Number **9909675**

ETC Lab ID **9909675-01**

Sample ID: OW-29(R)Comp

Matrix :SOIL

Sample Date :**09/23/99**

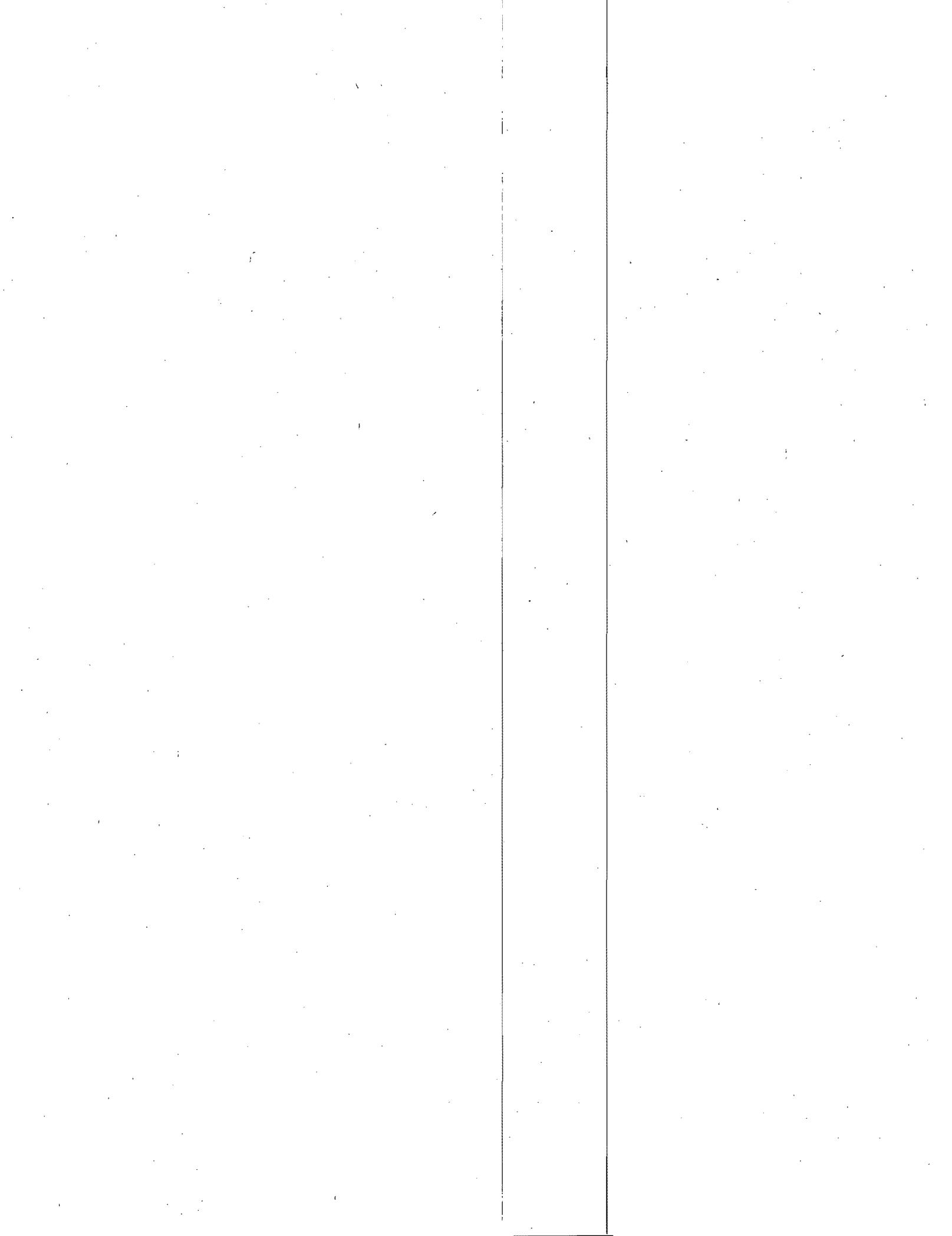
TEST	RESULT UNITS: (mg/L)	DL	DATE EXTRACTED	DATE ANALYZED	BY METHOD
TCLP Extraction Organics	Leachate		09/27/99		TL 1311
TCLP Semivolatiles			10/04/99	10/05/99	PF 8270C
QC Batch	P05238				
2, 4-Dinitrotoluene	ND	0.020			
Hexachlorobenzene	ND	0.020			
Hexachlorobutadiene	ND	0.020			
Hexachloroethane	ND	0.020			
2-Methylphenol	ND	0.020			
3-Methylphenol	ND	0.020			
4-Methylphenol	ND	0.020			
Nitrobenzene	ND	0.020			
Pentachlorophenol	ND	0.040			
2, 4, 5-Trichlorophenol	ND	0.020			
2, 4, 6-Trichlorophenol	ND	0.020			
Pyridine	ND	0.040			

Surrogate Standard	% Recovery	QC Limits	
S1 - Nitrobenzene-d5	79	29	110
S2 - 2-Fluorobiphenyl	72	38	107
S3 - 4-Terphenyl-d14	86	33	122
S4 - Phenol-d6	34	7	58
S5 - 2, 4, 6-Tribromophenol	89	16	138
S6 - 2-Fluorophenol	49	8	88

ND - Not Detected

DL - Detection Limit

 LABORATORY MANAGER



ENVIRONMENTAL TESTING & CONSULTING, INC.

2924 Walnut Grove Road - Memphis, TN 38111 - (901)327-2750

ORGANIC ANALYSIS DATA SHEETClient Name **IT Corporation**Project # **799453**

FID #

2606 Corporate Avenue**Suite 191****Memphis, TN 38132**Site ID **Williams Refinery****543 West Mallory-Memphis, TN**Date Arrived **09/24/99**ETC Order Number **9909675**ETC Lab ID **9909675-02****Sample ID: OW-34(R)Comp**Matrix :**SOIL**Sample Date :**09/23/99**

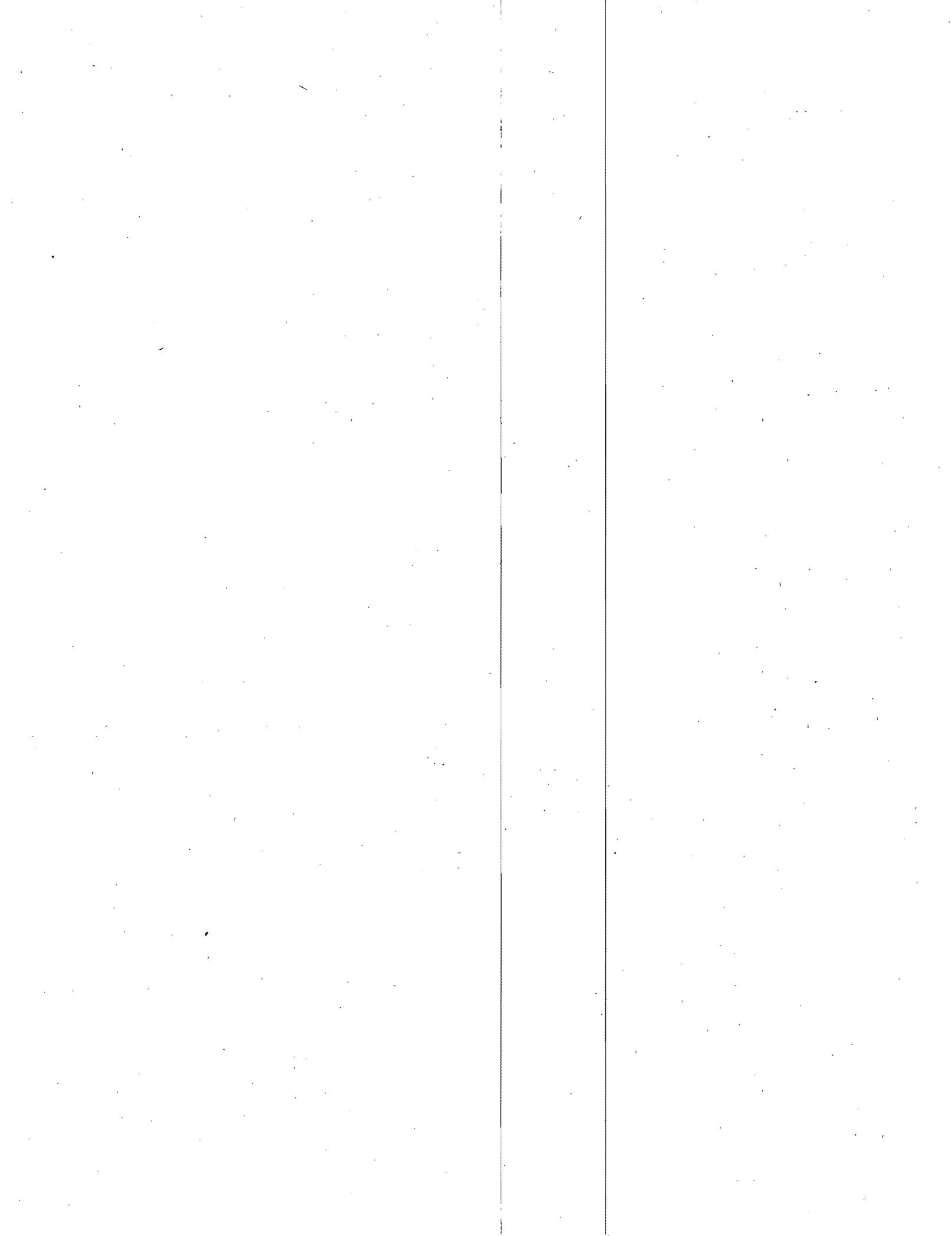
TEST	RESULT UNITS: (mg/L)	DL	DATE EXTRACTED	DATE ANALYZED	BY METHOD
TCLP Extraction Organics	Leachate		09/27/99		TL 1311
TCLP Semivolatiles			10/04/99	10/05/99	PF 8270C
QC Batch	P05238				
2,4-Dinitrotoluene	ND	0.020			
Hexachlorobenzene	ND	0.020			
Hexachlorobutadiene	ND	0.020			
Hexachloroethane	ND	0.020			
2-Methylphenol	ND	0.020			
3-Methylphenol	ND	0.020			
4-Methylphenol	ND	0.020			
Nitrobenzene	ND	0.020			
Pentachlorophenol	ND	0.040			
2,4,5-Trichlorophenol	ND	0.020			
2,4,6-Trichlorophenol	ND	0.020			
Pyridine	ND	0.040			

Surrogate Standard	% Recovery	QC Limits	
S1 - Nitrobenzene-d5	62	29	110
S2 - 2-Fluorobiphenyl	57	38	107
S3 - 4-Terphenyl-d14	75	33	122
S4 - Phenol-d6	28	7	58
S5 - 2,4,6-Tribromophenol	75	16	138
S6 - 2-Fluorophenol	41	8	88

ND - Not Detected

DL - Detection Limit

 LABORATORY MANAGER



ENVIRONMENTAL TESTING & CONSULTING, INC.
 2924 Walnut Grove Road - Memphis, TN 38111 - (901)327-2750
ORGANIC ANALYSIS DATA SHEET

Client Name **IT Corporation**

Project # **799453**
 FID #

**2606 Corporate Avenue
 Suite 191
 Memphis, TN 38132**

Site ID **Williams Refinery
 543 West Mallory-Memphis, TN**

Date Arrived **09/24/99**

ETC Order Number **9909675**

ETC Lab ID **9909675-01**

Sample ID: OW-29(R)Comp

Matrix :**SOIL**

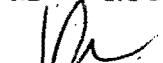
Sample Date :**09/23/99**

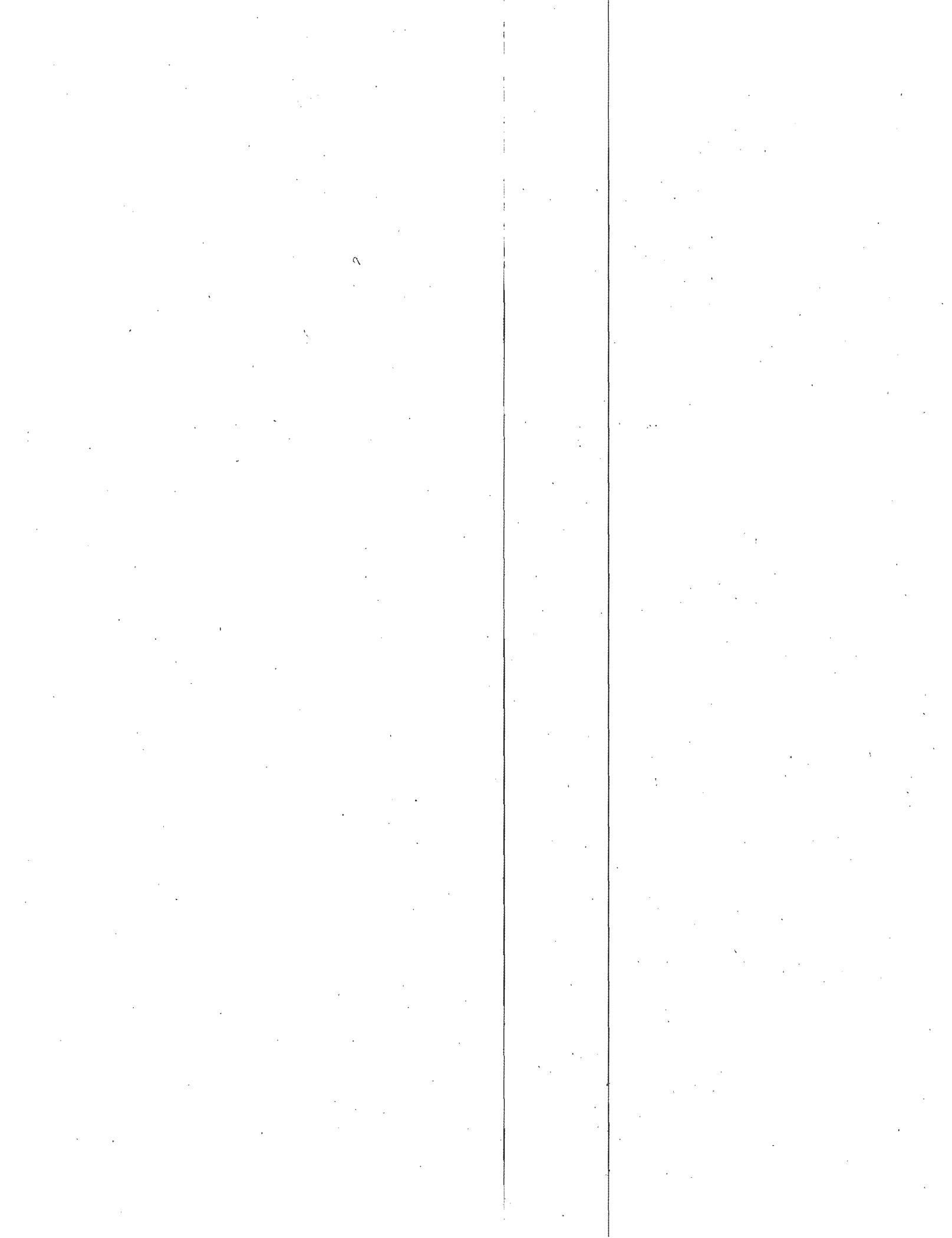
TEST	RESULT UNITS: (mg/L)	DL	DATE EXTRACTED	DATE ANALYZED	BY METHOD
TCLP Extraction ZHE	Leachate		09/27/99		TL 1311
TCLP Volatile Organics				10/08/99	LS 8260B
Benzene	ND	0.010			
Carbon Tetrachloride	ND	0.010			
Chlorobenzene	ND	0.010			
Chloroform	ND	0.050			
1,4-Dichlorobenzene	ND	0.010			
1,2-Dichloroethane	ND	0.010			
1,1-Dichloroethene	ND	0.010			
Methyl Ethyl Ketone	ND	0.200			
Tetrachloroethene	ND	0.010			
Trichloroethene	ND	0.010			
Vinyl Chloride	ND	0.010			

Surrogate Standard	% Recovery	QC Limits	
S1 - Dibromofluoromethane	103	74	123
S2 - Toluene-d8	105	86	112
S3 - 4-Bromofluorobenzene	96	81	115

ND - Not Detected

DL - Detection Limit


 LABORATORY MANAGER



ENVIRONMENTAL TESTING & CONSULTING, INC.

2924 Walnut Grove Road - Memphis, TN 38111 - (901)327-2750

ORGANIC ANALYSIS DATA SHEET

Client Name IT Corporation

Project # 799453

FID #

2606 Corporate Avenue

Suite 191

Memphis, TN 38132

Williams Refinery

543 West Mallory-Memphis, TN

Site ID

Date Arrived 09/24/99

ETC Order Number 9909675

ETC Lab ID 9909675-02

Sample ID: OW-34(R)Comp

Matrix : SOIL

Sample Date :09/23/99

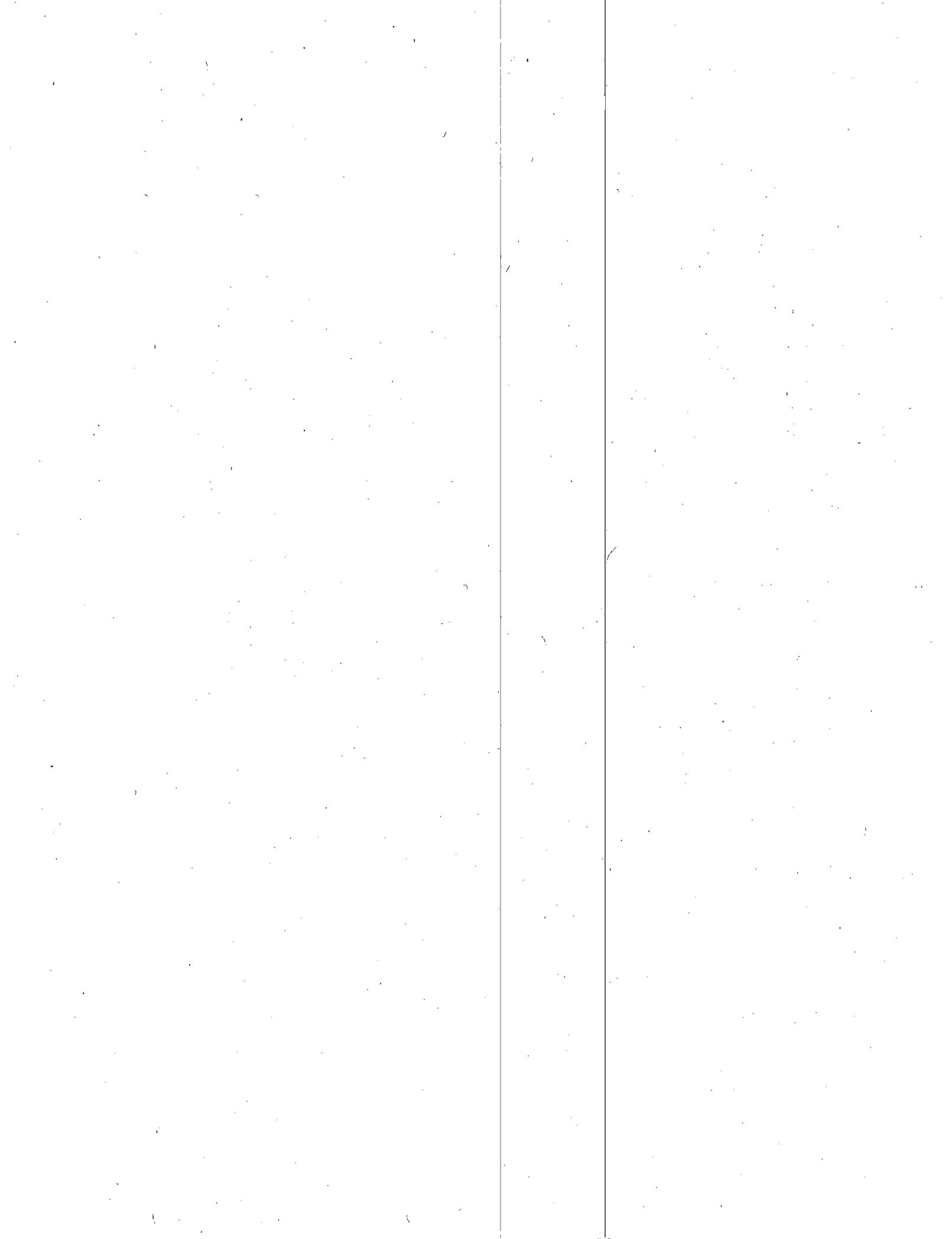
TEST	RESULT	UNITS: (mg/L)	DL	DATE	DATE	METHOD
				EXTRACTED	ANALYZED	
TCLP Extraction ZHE	Leachate			09/27/99		TL 1311
TCLP Volatile Organics					10/08/99	LS 8260B
Benzene	ND	0.010				
Carbon Tetrachloride	ND	0.010				
Chlorobenzene	ND	0.010				
Chloroform	ND	0.050				
1,4-Dichlorobenzene	ND	0.010				
1,2-Dichloroethane	ND	0.010				
1,1-Dichloroethene	ND	0.010				
Methyl Ethyl Ketone	ND	0.200				
Tetrachloroethene	ND	0.010				
Trichloroethene	ND	0.010				
Vinyl Chloride	ND	0.010				

<u>Surrogate Standard</u>	<u>% Recovery</u>	<u>QC Limits</u>
S1 - Dibromofluoromethane	101	74 123
S2 - Toluene-d8	104	86 112
S3 - 4-Bromofluorobenzene	97	81 115

ND - Not Detected

DL = Detection Limit

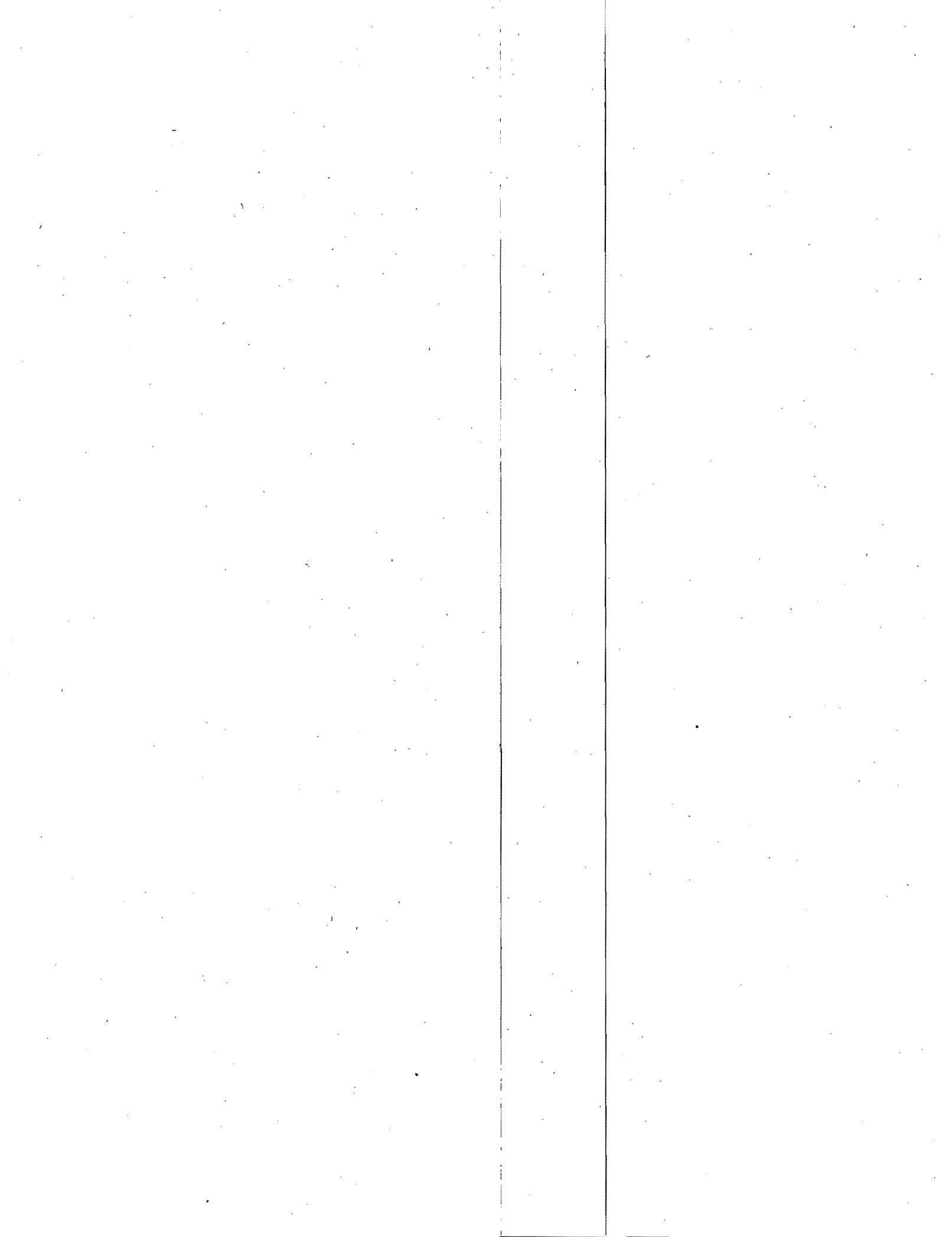
6
LABORATORY MANAGER



Environmental Testing & Consulting, Inc.
Data Qualifiers for Organic Reporting

Within the attached report, some analytical data may be reported as "Qualified Data" as indicated by a "Data Qualifier" next to the result. This table summarizes the possible "Data Qualifiers" that may be associated with this report.

Q	Surrogate Recovery Outside QC Limits
J	Estimated Value. Presence of the compound was confirmed but less than the reported detection limit.
E	Concentration exceeds the established method calibration range but is within the working range of the instrument.
B	Analyte detected in the associated Method Blank.
U	Reported result was unconfirmed. Refer to Case Narrative.
N	Non-Compliance Report associated with this sample or project.
C	Result reported from GC/MS confirmation analysis.
M	Result reported represents a minimum value. Refer to Case Narrative.
NC	Result reported from Primary Column. Result did not confirm.
*	QC Data (percent recovery/RPD for a particular analyte was outside QC Limits)



MAPCO PETROLEUM INC.

Company Name: IT Corporation Phone #: 901 332 8056

Address: 260 Corporate Ave. Memphis TN 38111

Store #: 111112 Ref ID#:

Task 4

Task 7

Project Manager, (Consultant)

State Certification #

I attest that the proper field sampling procedures were used during the collection of these samples.

Sampler Name (Print):

**CHAIN-OF-CUSTODY RECORD
AND ANALYSIS REQUEST**

